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Factor Prices and International Trade

By Abba P. Lerner

(*The following article was prepared by Professor Lerner for a seminar at the London School of Economics in December 1933. It is the paper referred to by Professor Samuelson in his article, "International Factor-Price Equalisation Once Again"*, Economic Journal, *June 1949, p. 181. It is reproduced here as it was originally written; and it will be of value to students both for its place in the history of ideas and also for the geometric technique employed to demonstrate conditions for the equalisation of factor prices.*)

1. Following the accepted tradition of International Trade Theory, let us make the following usual assumptions:

(1) Factors are not allowed to move between countries.

(2) Finished commodities can move between countries without cost.

(3) Perfect competition.

(4) There are only two countries, two commodities and two factors.

To which we add

(5) The same technical knowledge is available in both countries.

From (2) and (3) it follows that the same commodities must have the same price in both countries (all prices being converted on to a common basis at the current rate of exchange) and also the same cost of production wherever they are produced.

A first glance at these considerations would seem to suggest that there must be complete specialisation in at least one of the commodities unless factor prices are the same in both countries. For if in equilibrium one factor is cheaper in one country than in the other, the other factor must be dearer or else the first country would export both commodities and import neither. From this it would follow that the commodity which used a larger proportion of the cheaper factor would have a lower cost in this country than in the other so that the conditions of equilibrium would be upset by any difference of factor prices as between the two countries.

2. This seems to fit in with the general view that divergent scarcities of factor are the moving forces behind international trade. In lieu of the export of *factors* which are unable to move, there are exported commodities which contain the services of cheaper factors in a greater proportion than the commodities which are imported. This movement extends until either (*a*) complete specialisation has already been reached, i.e. there is no commodity being produced abroad which contains a greater proportion of this cheaper factor than any commodity produced at home, or (*b*) the price of the cheaper factor has risen to equality with its price abroad. *Therefore, if both commodities are produced in both countries, the equilibrium must be of the second type, i.e. factor prices must be the same in both countries.*

3. Against this it is often objected that it is impossible for factor prices to be the same if the ratio between total quantities of the factors is different in the two countries. For if factor prices are the same, the proportion in which factors are combined in the production of commodities must be the same, so that some of the factors would remain unemployed and so change the price.

This argument is based upon a confusion between two ratios: the ratio between the factors in the production of a particular commodity, and the ratio between the quantities of factors in a country. There is no need whatever for these to be the same. The larger proportion of a factor in one country can be taken up in the production of the commodity which uses a larger proportion of this factor, if this commodity is produced in a greater proportion to the other commodities in this country than in the other country. Thus if in countries 1 and 2, commodities A and B are made from factors X and Y, if the factor prices are the same in both countries, the factors will be combined in the same proportion in both countries for the production of each commodity. Suppose one unit of X and one unit of Y combine to make a unit of A, and one unit of X and 5 units of Y combine to make a unit of B. Then the proportions between the factors in each country can be anything between 1 : 1 and 1 : 5. If in country 1 there are 100 X and 200 Y and in country 2 there are 100 X and 400 Y, all this means is that the proportion of B to A manufactured will be greater in country 2 than in country 1. There will be made altogether 100 units of A and 100 units of B. Country 1 producing 75 A and 25 B and country 2 producing 25 A and 75 B, all the factors being used. For every combination of factors and set of coefficients, there will be a distribution of production between the countries which will just use up all the factors.

Nor is it necessary to assume fixed coefficients of production as the above arithmetical example might seem to imply. Fig. 1 shows how the factors of a country are distributed between the production of two commodities for all proportions between the quantities of the commodities.

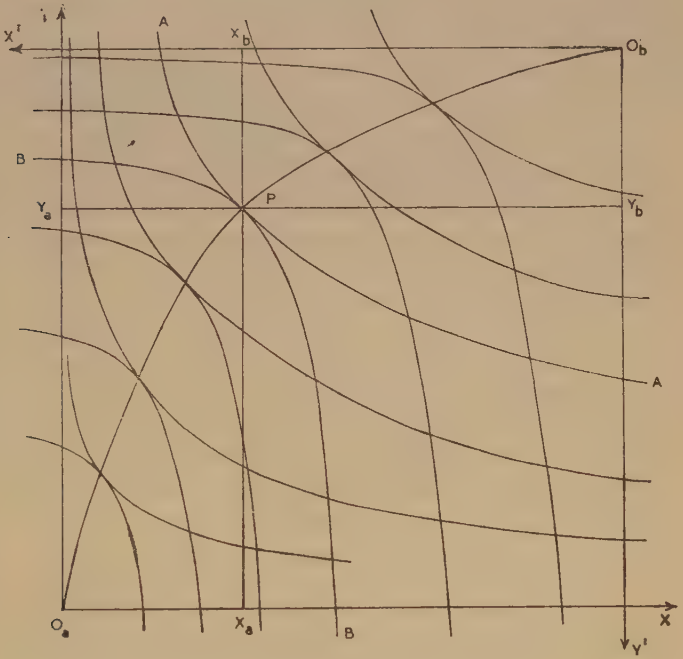

Fig. 1

Along O_aX and O_aY are measured quantities of the factors X and Y used in the production of commodity A. The curve A and all the other similarly shaped curves which are convex to the origin O_a are isoquants of the commodity A—each curve showing different combinations of X and Y which together produce the same quantity of commodity A. The point P on the curve A indicates that O_aX_a of X and O_aY_a of Y can produce the quantity of A to which that particular curve A corresponds. There are an infinite number of such curves filling the space between the axes. All the isoquants are assumed to be similar in shape (for the same commodity), differing only in scale.[1]

The axes O_bX^1 and O_bY^1 and the curves like B which are convex to the origin O_b represent exactly the same thing for commodity B instead of A. The point P on the curve B indicates that O_bX_b of X and O_bY_b of Y can produce that quantity of B to which that particular curve B corresponds.

The origin O_b (and the whole system of axes and curves connected with it) is so placed that the co-ordinates of O_b with respect to the origin O_a (or the co-ordinates of O_a with respect to the origin O_b—which amounts to exactly the same) measure the total available factors of production X and Y in the country. Any point within the rectangle formed by the two pairs of axes will give two pairs of co-ordinates, one for each system. The first pair will represent quantities of factors used in the production of commodity A and the second pair will represent quantities used in the production of B. The sum of these will be equal to the total supply of the factors.

Not all points in this rectangle represent economic distributions. These are limited to the curve O_aPO_b which is the locus of points where A isoquants and B isoquants touch each other. From any other point it is possible, by moving towards this curve, to increase the output of one or both of the commodities. This curve shows all the possible distributions of the factors between the commodities as conditioned by the technical knowledge represented by the isoquants, the quantities of the factors, represented by the relative positions of the two systems, and the economic consideration of producing as much as possible with given resources, represented by the choice of points where isoquants are tangential. Where, on this curve, production will take place will depend upon conditions of demand in this country and upon the desire to trade by the other country (which depends upon both the technical conditions in the other country and upon conditions of demand there). This curve shows what possible ratios of factors in the production of any commodity are compatible with the existing ratio of factors in the country.

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[1] This means that the production function is homogeneous and there are no economies of scale. This is assumed throughout this article, for, if there are economies of scale, there must arise complete specialisation in at least one of the commodities (i.e, one of the commodities, at least, will be produced in only one country) so that the problem with which we wish to deal cannot arise.

4. The argument given in sections (1) and (2) is not sufficiently rigid and certain limitations have to be imposed upon the propositions enumerated. It will, however, be found to provide a substantially reliable rough expression of the correct theory.

If A and B are the *prices* of the commodities, X and Y the *prices* of the factors, K and L the respective quantities of X and Y used in the production of a unit of A, M and N the quantities used in the production of a unit of B and the subscripts 1 and 2 indicate to which country the prices or quantities refer, we can express the conditions of equilibrium in the equations :

$$\left.\begin{aligned} A_1 = K_1\,X_1 + L_1\,Y_1 = K_2\,X_2 + L_2\,Y_2 = A_2 \\ B_1 = M_1\,X_1 + N_1\,Y_1 = M_2\,X_2 + N_2\,Y_2 = B_2 \end{aligned}\right\} \quad ..\ (1)$$

These equations are satisfied if factor prices are the same in both countries, for in that case the proportion of the factors used in each commodity must be the same in both countries, all the subscripts disappear and the equations become identities.

5. Contrary, however, to what seems to be implied in the simple reasoning of section (1) this is not the only solution. There are possible two other types of solution, but these depend upon such unlikely conditions that they may fairly be said to be of theoretical rather than practical interest even when comparing them with the abstract theoretical problem which we have so far discussed.

The first of these two " theoretical " solutions[1] refers to the case where the ratios of the factors are the same in each country for *both* commodities. It is then possible for factor prices to be different in the two countries, one factor cheaper in one country and the other factor cheaper in the other country, while the argument of section (1) could not be applied as there is no commodity " which uses a larger proportion " of any factor. Against the objection that in this case the two commodities are economically "one commodity" the view was held that this identity of factor proportions need not be true for all price relationships, but only for those reached in the equilibrium position.

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[1] Suggested to me by Mrs. J. Robinson of Cambridge.

It can be shown that these conditions are not sufficient to assure equilibrium. If $\frac{K_1}{L_1} = \frac{M_1}{N_1}$ and $\frac{K_2}{L_2} = \frac{M_2}{N_2}$ it is still possible to have the case indicated by the equations

$$\left.\begin{array}{l} A_1 = 2X_1 + 3Y_1 = 5X_2 + 2Y_2 = A_2 \\ B_1 = 4X_1 + 6Y_1 = 15X_2 + 6Y_2 = B_2 \end{array}\right\} \quad .. \quad (2)$$

where the coefficients of production, K, L, M and N of equations (1) are replaced by figures which satisfy the conditions of equal ratios of factors for both commodities in each country as well as the general condition of a positive and finite elasticity of substitution. It is obvious that both of these equations cannot be true whatever the prices of the factors. Unless factor prices are the same in both countries (in which case K, L, M and N would have to be the same too) it is necessary that $\frac{K_1}{M_1} = \frac{K_2}{M_2}$ and also, which would follow, that $\frac{L_1}{N_1} = \frac{L_2}{N_2}$. This is only likely to be the case if the technical conditions of production of the two commodities are identical over a considerable range, so that, economically, they are *one commodity*.

6. The second "theoretical solution" is indicated by the following values of the terms in equations (1).

X_1	Y_1	K_1	L_1	M_1	N_1	X_2	Y_2	K_2	L_2	M_2	N_2
10	3	3	16	2	20	7	5	4	10	5	9

Substituting these in the equations we get:

$$\left.\begin{array}{l} A_1 = (3 \times 10) + (16 \times 3) = (4 \times 7) + (10 \times 5) = A_2 = 78 \\ B_1 = (2 \times 10) + (20 \times 3) = (5 \times 7) + (9 \times 5) = B_2 = 80 \end{array}\right\} \quad .. (3)$$

Here neither factor prices nor proportions of factors are the same, yet the equations are satisfied. This case definitely shows the simple argument of section 1 to be erroneous. The special condition under which such solution may be possible will be best shown by a diagrammatical treatment of the problem.

7. Fig. 2 shows two isoquants, A and B, for unit quantities of the two commodities. By our assumption of equal technical knowledge they are applicable to both countries.

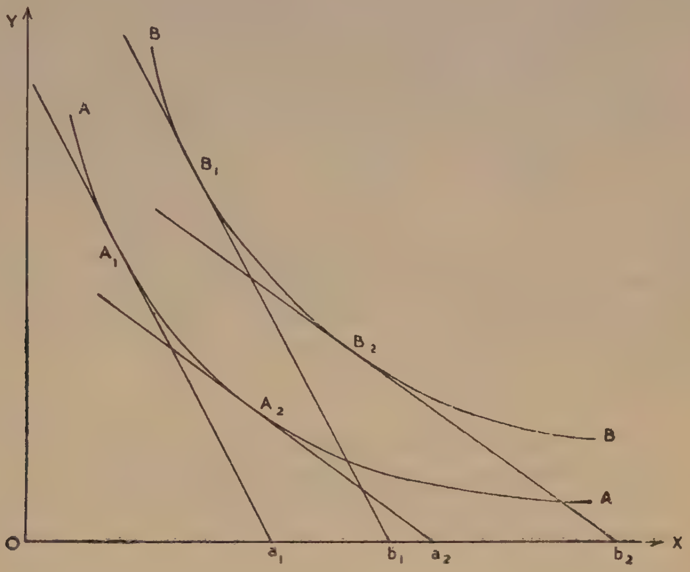

Fig. 2

Let a pair of parallel tangents be drawn to the two isoquants at A_1 and B_1 to cut the X axis in a_1 and b_1 and another pair of parallel tangents at A_2 and B_2 to cut the X axis in a_2 and b_2. The slope of the first pair of parallel tangents represents the price ratio of the factors in country 1, and the slope of the second pair of tangents represents the price ratio of the factors in country 2. All combinations of factors indicated by the co-ordinates of points on a tangent will have the same total value at the price ratio indicated by the slope of the tangent. Factors will be used in the proportions indicated by the co-ordinates of the point where these tangents touch the isoquants, for these are the points where, at the given factor-price ratio, any expenditure on factors gives a maximum output of the commodity. In country 1 the quantities of factors per unit of commodity will be measured by the co-ordinates of A_1 and B_1 and in country 2 they will be measured by the co-ordinates of A_2 and B_2.

Since the value of a unit of a commodity is equal to the value of the factors it incorporates, and since all points on a tangent represent the same value, the value in country 1 of a unit quantity of A will be equal to the value of a_1 of factor X, and a unit of B will be equal in value to b_1 of factor X. In country 2 commodities A and B will be worth a_2 and b_2 respectively in terms of factor X. The conditions of equilibrium, that relative commodity prices are the same in both countries, can then be represented by the formula

$$\frac{a_1}{b_1} = \frac{a_2}{b_2}$$

8. If factor prices are the same in both countries, this condition is satisfied for curves of any shape and for all factor-price relationships, for the two pairs of parallel lines coincide and become one pair of parallel lines, $a_1 = a_2$ and $b_1 = b_2$.

9. Equilibrium may be reached with factor prices different in the two countries if the proportions in which the factors are used are the same for both commodities in each country but not the same in both countries. This is Mrs. Robinson's case and is shown in Fig. 3. It can also be easily seen that

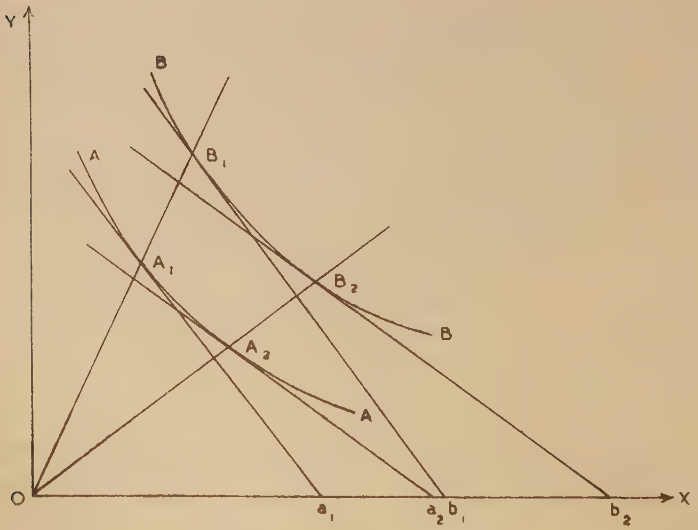

Fig. 3

these conditions are not sufficient for the equilibrium to be reached, for, by similar triangles, $\frac{a_1}{b_1}=\frac{a_2}{b_2}$ only if $\frac{OA_1}{OB_1}=\frac{OA_2}{OB_2}$. The meaning of this and the likelihood of its happening will be investigated below when we come to analyse possible relationships between the isoquants of the different commodities.

10. Of all possible relationships between the shapes of the isoquants for the two commodities, the most likely case seems to be that in which one commodity will use a relatively larger proportion of one of the factors, whatever the relative prices of the factors in the country. If B is the commodity which at all factor-price ratios uses a relatively larger proportion of X, this will be shown by the two different isoquants being so shaped that if two parallel tangents are drawn to them at A_1 and B_1 in Fig. 4, OA_1 will be steeper than OB_1, whatever the slope chosen for the parallel tangents. From this it follows that if any line from the origin cuts both A and B, say at A_1 and B_2, the tangent at B_2 will be

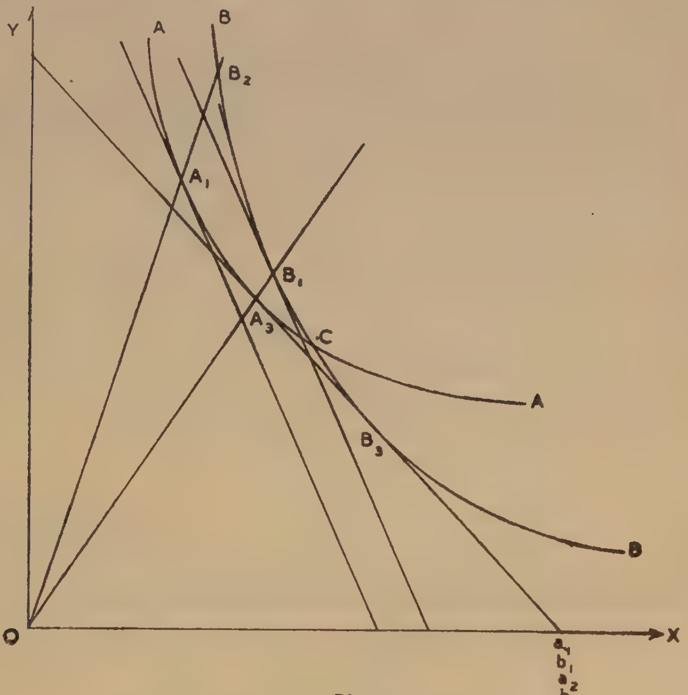

Fig. 4

steeper than the tangent at A_1 because the tangent at B_2, which is to the left of B_1 will be steeper than the tangent at B_1 which is parallel to the tangent at A_1.

This means that if for each factor-price ratio the corresponding quantity ratio of X to Y is greater for B than for A, then it will also be true that for every quantity ratio of X to Y the corresponding price of X (relatively to that of Y) will be greater for B than for A. B will only give up using a greater proportion of X if X is dearer for it than for A.

Remembering that there are an infinite number of both kinds of curves—all of the same shape but differing in scale (the homogeneous production function) we may further say that no A curve can be cut more than once by the same B curve and vice versa. We can see the reason for this if we imagine OB_2 swinging round from the Y axis towards the X axis. The steeper slope at B_2 than at A_1 means that as long as B is above A the curves are convergent until they cut at C, and then they diverge all the time so that they cannot come together to cut again.

For curves of this nature the only solution is that of equal factor prices in both countries unless there is complete specialisation in at least one commodity in the sense that not more than one of the commodities is produced in *both* countries. The second solution (Mrs. Robinson's) is not possible because at no price relationship will the proportion of the factors be the same for both commodities. The third solution suggested in section (6) above cannot apply for it shows B using a smaller proportion of X (relative to Y) than A at the factor-price ratio of country 1 but using a greater proportion at the factor-price ratio of country 2.

The impossibility of any solution other than the first can be demonstrated diagrammatically. Suppose the Fig. 2 to represent equilibrium conditions so that $\frac{a_1}{b_1} = \frac{a_2}{b_2}$. Since the production functions are homogeneous we can obtain a curve of a different size but of the same shape by changing the size of our unit quantity. Consider a B curve smaller than that drawn in Fig. 2 in the proportion $\frac{a_1}{b_1}$. The tangent to this curve for country 1 will coincide with the tangent A_1a_1. Since $\frac{a_1}{b_1} = \frac{a_2}{b_2}$ the tangent B_2b_2 will coincide with

A_2a_2. We shall then have two lines each touching the two same isoquants and this is necessary for equilibrium.

But in Fig. 4 it is impossible to draw two lines each of which touches both A and B. Only one line can do this—the one touching them at A_3 and B_3. Full equilibrium with curves of this form can therefore only take place if the prices of the factors are the same in both countries.

11. If a pair of curves A and B cut in two places (C and D in Fig. 5), one curve must be more convex than the other.

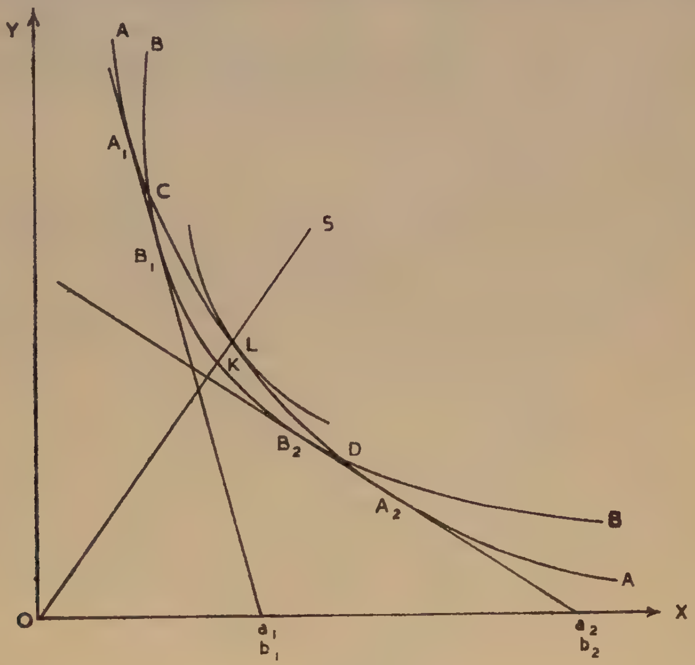

Fig. 5

The elasticity of substitution of the factors in the production of one commodity must be so much greater than for the other commodity that somewhere between C and D the isoquants A and B are parallel for the same ratio between the quantities of factors used. At K and at L and all along OS, A and B curves are tangential to each other. The relative quantity of X for any factor-price ratio is greater for B than for A above OS and smaller below OS. Every tangent to both an A and a B curve must touch both either *on the same side of* OS or *on* OS.

In the former case one other tangent can touch the same two isoquants *on the other side of* OS. The factor-quantity ratios as between the two commodities will be reversed in the two countries. The same commodity (A) will be able on account of its greater elasticity of substitution to use relatively more in each country of that factor which is cheaper in that country, and thus maintain the same price relationship to the other commodity. This is the state of the arithmetical solution in section (6). It will be possible, however, at *only one* factor-price relationship in each country for any factor-price relationship in the other country. This will be at the point where the change in the proportion of the factors used *just balances* the differences in factor prices as between the two countries. This solution is clearly possible only as an unlikely coincidence.

12. The case where two curves A and B cut each other in three places is shown in Fig. 6 where they cut at C, D and E.

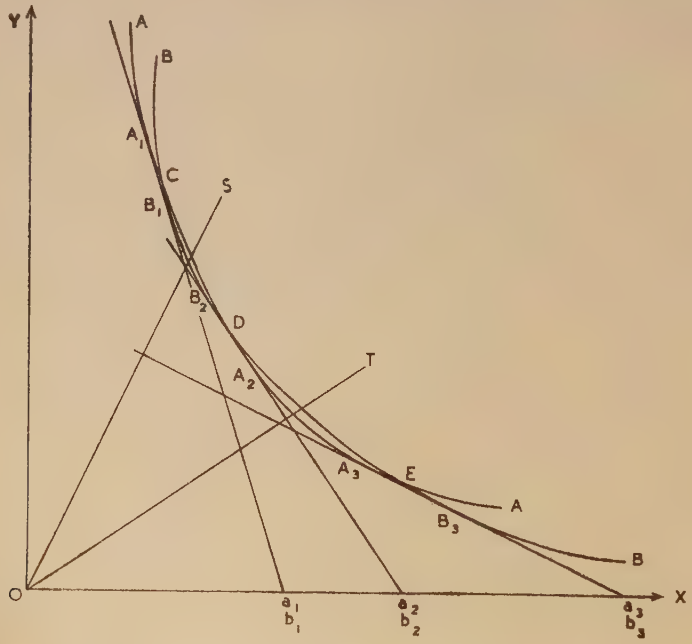

Fig. 6

It will here be possible to draw three different lines each of which touches both A and B, each line representing a different possible factor-price ratio in a different country, all three countries being in international trade equilibrium. There will also now be two lines radiating from the origin, OS and OT, along which A and B curves touch each other. The points of tangency of any line with the curves A and B will be either *both* above OS, in which case B_1 will be *below* A_1, or *both* between OS and OT, when B_2 will be *above* A_2, or else *both* below OT, when B_3 will be again below A_3.

In comparing country 1 with country 2 and in comparing country 2 with country 3 in Fig. 6, we have exactly the same case as that described in the section (11). But in comparing country 1 with country 3 we have a new phenomenon. In country 1 factor X is dear and in country 3 X is cheap. In both countries commodity B uses relatively more of X as compared with commodity A. Yet prices of both commodities are equally affected by the change in the price of the factors.

This is because the gain of the commodity (B) which uses a larger proportion of the cheapened factor (X) in virtue of the saving in the cost of the quantity initially used is offset by the loss due to its not being able to increase its proportion of the cheapened factor in as great a ratio as the other commodity (A) which uses a smaller proportion of this factor.

This solution, too, can be seen to be a very unlikely case as again for any factor-price ratio in country 1 there is only one corresponding factor-price ratio in country 3 where the counterposed forces are just equal and an equilibrium is attained. There appears to be no mechanism whereby such a position would be approached so that it must be considered as an unlikely accidental solution that would be immediately upset by any change in data if indeed it ever happened to be hit upon.

13. A tangent to both curves at the same point, which would have to be on a line of the type of OS or OT, would show a special kind of equilibrium, having some of the qualities of all the different types considered, and therefore also partaking of the attribute of stability. It would show not only the same factor prices in both countries, which is a sufficient condition for stable equilibrium, but also the ratio of factors the same for both commodities, not only in each country but, which would follow from this and from the equality of factor prices, in both countries.

14. It is not necessary to go on to consider curves which cut more than three times. It can be seen that curves which

cut *n* times have *n* possible common tangents and *n*-1 " radiants of tangency " as OS and OT may be called. The more often curves cut, the more alike they must be in shape, and we may say that the more often they cut, the closer they approach identity of shape. Curves may be expected to be identical rather than cut many times.

The likelihood of a solution of the type illustrated in Fig. 3 can be indicated by considerations of this kind. We have seen above (section (10)) that in any equilibrium in which factor prices are different in the two countries, two common tangents can be drawn to the two curves. This means that, in Fig. 3, another B curve, say B^1, touches both A_1a_1 and A_2a_2. Since all our curves represent homogeneous functions, and A and B have parallel tangents (= equal slope) at A_2 and at B_2, A and B curves must touch each other along OB_2. Similarly, they must touch each other along OA_2. B^1 will therefore touch A_1a_1 and A_2a_2 at the same points where these are touched by A, namely at A_1 and A_2.

This is shown in Fig. 7. OS and OU are " radiants of tangency ", and there must be another " radiant of

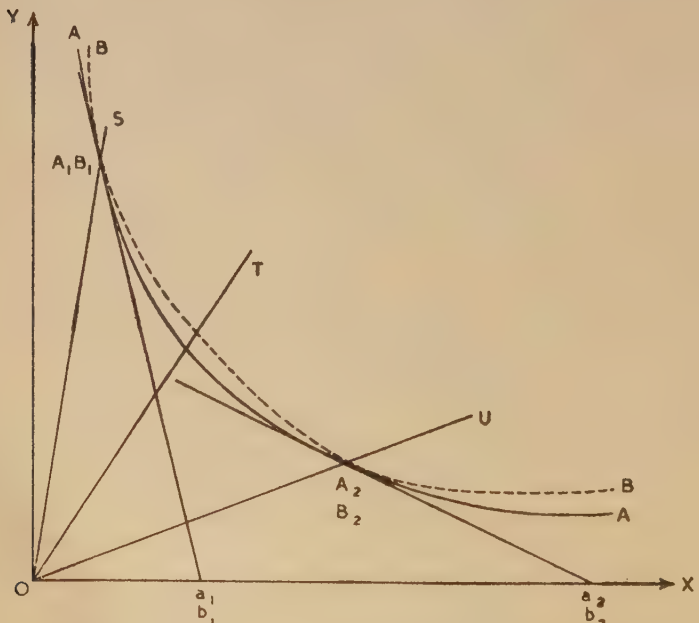

Fig. 7

tangency " between these (unless the curves are identical throughout in which case these cover the whole surface) and it is here shown in OT. Three " radiants of tangency " must mean curves cutting four times. This is seen to be the case, for the B curve immediately below B^1 must cut A in four places, once on each side of A_1 and A_2.

We see then that the equilibrium of Fig. 3 demands isoquants which cut four times without becoming identical. But this is not all. If we consider the B curve immediately above the one drawn we shall see that it does not cut A at all. This means that not only must there be B curves which cut A on A curve four times, but that any B curve which does not cut A four times *must not cut it at all.* Either four or none. Only if this is the case will any B curve *touch* an A curve twice.

Further, coincidence is necessary for this equilibrium even if we are given isoquants of this form. There are only two factor-price ratios in any country which make this equilibrium possible and if one of these is reached the equilibrium is not possible unless the factor-price ratio in the other country is the other of this pair of factor-price ratios which are shown in the two tangents in Fig. 7.

From all this we may conclude that if two (or more) commodities are produced in each of two (or more) countries, between which commodities can move and in which the same technical knowledge is available, then in any stable or reasonably likely equilibrium physically similar factors, even though they may not move between the countries, will have the same price in each country.

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A Note on Mr. Lerner's Paper[1]

By I. F. Pearce

Mr. Lerner's case for factor-price equalisation in the foregoing article rests principally on the contention that any trading equilibrium, other than that which leads at the same time to equal factor prices, is, in some sense, unstable. He shows that other positions of equilibrium are possible but argues that these can arise only as a result of coincidence and that

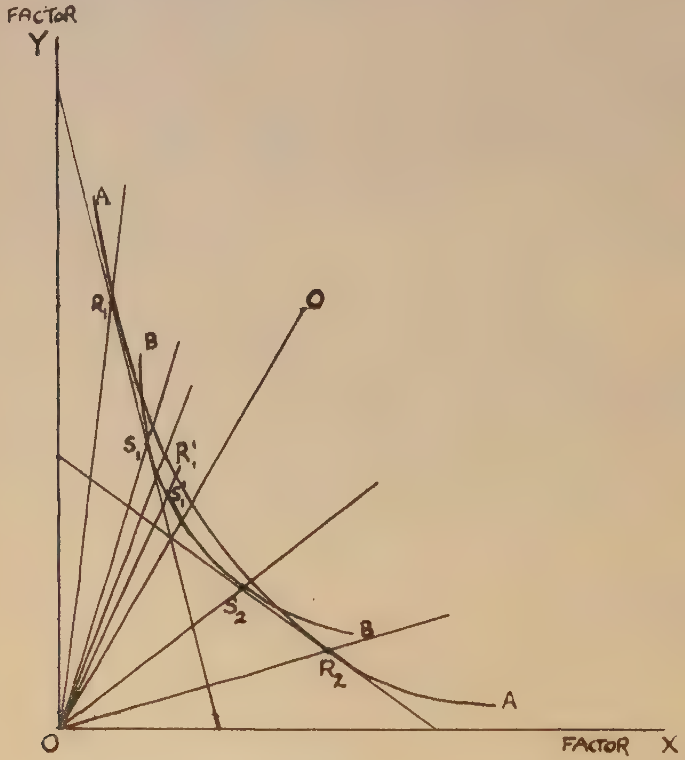

fig (i)

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[1] My thanks are due to Professor J. E. Meade on whose suggestion this note is based.

ordinary economic forces will not operate to bring them about. It is the purpose of this note to show that Mr. Lerner is incorrect in this contention.[1]

Countries 1 and 2, producing commodities A and B, are assumed to be in trading equilibrium of the kind which Mr. Lerner supposes to be unstable. The units in which commodities A and B are measured are chosen so as to make their price ratio 1 : 1. This is illustrated in fig. (i), a diagram of the kind used by Mr. Lerner. OO is, in Mr. Lerner's terminology, the radiant of tangency. Country 1 produces A and B with factor ratios defined by OR_1 and OS_1 respectively whilst country 2 uses factors in the proportions OR_2 and OS_2.

Consider the effect on the commodity-price ratio of any change in the factor proportions in country 1. If R_1 and S_1 move to the right to some new position, say R'_1 and S'_1, then clearly the price of A will have increased relative to B. This follows from the fact that the tangent to the product contour A at R'_1 lies outside the tangent to the product contour B at S'_1, i.e. the price ratio A to B must be greater than unity. By similar argument (since R_1 and S_1 can, for this purpose, be regarded as arbitrarily chosen), it can be shown that any pair of factor proportions to the right of OR'_1 and OS'_1 will generate a still greater commodity-price ratio A to B, *so long as they lie to the left of the critical proportion* OO. Again by similar argument it follows that A will become relatively dearer in country 2 as points R_2 and S_2 move to the *left*. At OO therefore the price ratio A to B reaches a maximum. To show this we could very well have drawn fig. (i) with units chosen so that the product contours A and B were actually tangential at the factor proportion OO. In this case *any* tangent to curve A would lie inside the corresponding tangent to curve B except at the proportion OO where the two would be coincident. Thus the commodity-price ratio A to B would be everywhere less than unity except at OO where it would actually be unity; i.e. where it reaches a maximum.

Turning again to the original hypothetical equilibrium let us now suppose that there is an increase in the total supply of factor Y in country 1, so that its price relative to factor X falls. A, which uses the higher proportion of factor Y, will now become relatively cheaper in country 1 and the new factor proportions will lie to the left of OR_1 and OS_1. As a result country 2 will be induced to produce more of B in which it has the advantage. But, in country 2, B requires a higher proportion of Y to X than A; therefore the demand for Y and hence its price relative to X will increase. Points R_2 and S_2 will move to the right. As argued above this will lead to a rise in the price of commodity B relative to A until the comparative advantage of country 2 in the production of B disappears. This will happen all the sooner since the increased production of A in country 1 will also stimulate the demand for factor Y and raise its price. Factor proportions will be driven back towards their original positions OR_1 and OS_1 (without reaching them) thus tending to eliminate the comparative advantage in the production of A. A new and *quite stable* equilibrium will be reached in which the proportions of Y to X will have increased in country 1 and decreased in country 2. If now we imagine the endowment of factor Y reduced to its original level in country 1, the process would reverse itself and the original equilibrium would re-emerge.

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[1] Other arguments are considered in my paper, "International Trade . . . . . The Factor Price Equalisation Myth," *R.E.S.* February, 1952.

University of Nottingham.

Further Reflections on Retail Pricing

I.

By MARGARET HALL

The article "Imperfect Competition in Retail Trades" by Mrs. Hood and Mr. Yamey, published in the May issue of *Economica*, contains some interesting and important reflections on the character of retail trade. If the main purpose of the authors had been, in the light of these reflections, to question the use of static models in the analysis of competition in retail trade and if they had followed up their leading statement: "It is not useful to rely upon the essentially static and long-run theory of monopolistic competition to explain the economics of retailing" by an attempt to construct a dynamic model, their work would indeed have been a major contribution. The declared purpose of the authors is, however, much more limited and much more doubtful. It is to dispute the appraisal of the working of competition in retail trade contained in Henry Smith's *Retail Distribution* and in my *Distributive Trading*. What they object to is the discussion of retail trade in terms of the analysis of imperfect competition and oligopoly: "The main point at issue," they write, "is whether the degree and nature of the imperfections are such that it is more realistic to stress the imperfections than it is to stress the competition (particularly in its price-reducing aspect) in the study of retail markets". They hold that a dominant emphasis on imperfections is mistaken. This is the first point they wish to establish and it is critical in intent. Their second point is positive and has serious practical implications: in the absence of resale price maintenance, they argue, price competition in retail trade would be sufficiently ardent to bring about "excess capacity" in retailing "as a consequence of the ease of entry into the distributive trades and a sign of disequilibrium" but in no sense as a normal outcome of the way in which competition works at retail, which is what the theory of imperfect markets implies. The practical inference they draw is as follows: "It appears to us that the 'excess capacity' in retailing is a safeguard of the interests of consumers in that it tends to increase competition, particularly in its price-reducing aspect".

By what route do they reach this important conclusion? I should say, at the outset, that while I appreciate the main point at issue, as stated above, and while it is this that I wish to dispute, I cannot fully understand the authors' own analysis. What is implied, for instance, in the above statement about disequilibrium? What is the authors' own description of equilibrium in this field? What, in their view, determines the retailer's choice of his own present functions rather than any alternative complex? What determines his satisfaction with his existing clientele rather than a larger or a smaller volume of custom? The authors seem to me to sidestep these questions. Yet an answer to them is surely required before we can accept the sweeping conclusion that excess capacity in retailing is a "safeguard of the interests of consumers". If they reject the explanation of these phenomena in terms of monopolistic competition and oligopoly, which is the basis of their quarrel with Henry Smith and me, they must offer an alternative explanation. I cannot find one in their article. I cannot relate the many interesting reflections and compose from them an alternative analysis. My reasons for replying to their article, in spite of this, are three: first, their emphasis on perfections rather than imperfections in the retail market seems to me to jeopardise even the limited advance we have so far made in the analysis of these problems which, as I see it, depends on the abandonment of the assumption that a unique price-output relation confronts the individual seller. Secondly, their conclusion that competition in retail markets in the absence of price maintenance secures the interests of consumers seems to me a dangerous over-simplification, since the tendency towards or away from price competition (in the absence of restraints) on which they rely as the guarantor of consumers' interests, depends on a number of dynamic factors which are neither specified nor analysed in the article. I will develop these objections at a later stage. Meantime, there is a third and simpler objection. The convenient simplification of assuming away price maintenance is seriously misleading. One of the results of the analysis of retail trade problems in terms of imperfect competition and oligopoly is that there will be an irresistible tendency for arrangements proscribing price competition to be made. Since this tendency is inherent, it is improper to assume it away. Mrs. Hood and Mr. Yamey refer to the analysis of imperfect competition and oligopoly as analyses which virtually exclude the possibility of price competition, and object to this on the grounds that without specific arrangements for the maintenance of prices, it would be impracticable for retailers to maintain prices. This is exactly why they, in practice, make such arrangements and fortify them by agreement with the manufacturers to withdraw supplies as a sanction. The oligopoly analysis explains the very strong urge to make such agreements ; I do not understand it to imply that the restraints on price competition would take the form of voluntary restraints imposed by individuals.

To return to the earlier objections.

In order to arrive at their very positive conclusion that "'excess capacity' in retailing is a safeguard of the interests of consumers in that it tends to increase competition with respect to price. It is not a burden upon consumers from which they should necessarily be liberated", they must hold that, in the absence of price maintenance, competition in retail markets works in such a way as automatically to secure the consumers' interest. To establish this position, they must employ some index of the consumers' welfare which they say is being secured. They do not state what their hypothesis is here. They say "We do not wish to take issue with Mr. Smith and Mrs. Hall on the question whether retailing is or is not a textbook example of perfect competition. We agree at once that it (or for that matter any other industry or trade) has never measured up to the exact and rigorous requirements of the model of perfect competition." But they then add, after referring to the "sluggishness of the buyer in most retail markets (as contrasted with the buyer's postulated agility in perfect markets)" . . . "this difference in behaviour in perfect and retail markets does not warrant the view that it is apposite to stress the imperfections in retailing. The imperfections would be significant only if retailers aimed at maximising their profits in successive 'short runs' irrespective of long-run repercussions (i.e. irrespective of the effects of a policy adopted in one short period upon the results of later short periods)". Perhaps, in this last sentence, which I cannot understand, I have missed an indispensable part of the argument put forward in this article but, failing that, I consider that the alleged impropriety of stressing the imperfections in retailing as opposed to the perfections commits the authors to stressing the perfections since they provide no third possibility, a conclusion which is reinforced by their feeling themselves able to argue definitively that competition in retailing works in the interests of consumers. They think that perhaps the retailers' own interests are not best served in so far as price competition leads to over-capacity: "It leads to lower prices and, in a sense, the costs of maintaining it are borne by the retailers themselves in the form of lower returns than were anticipated." But they leave this last conclusion unexplained and merely in the form of a suggestion in order to concentrate on the idea that the system secures the interests of the consumers.

The central issue, here, seems to me to be the character of the demand curve confronting the individual seller in the retail market. By far the most important analytical advance in this field was to throw overboard for this purpose the Marshallian demand curve: indeed, when people refer to the character of imperfect as opposed to perfect markets, I should have thought that they meant to emphasise just this change of assumption: that the retailer is not confronted with a unique price-output relation but that, on the contrary, he can affect the price elasticity of demand and the level of demand at a given price by incurring selling costs and by product differentiation in general. In this case it immediately becomes misleading to talk in terms of competition in retail trade working towards supplying the community with what it wants (in the form of retail service) at minimum cost—the conclusion put forward in the final sentence of the article. For what measure of consumers' demand is there in these circumstances? In the present state of economic analysis we are agnostics; but, for this very reason, it is impossible to show that "'excess capacity' in retailing is a safeguard of the interests of consumers". Until the authors take some alternative stand on the fundamental questions why retailers produce the services they do and why they market goods at the prices they do, they cannot rightly claim to reverse the interpretation of these entrepreneurial decisions put forward by the theory of monolistic competition and oligopoly. Meantime, what they are doing is to pay lip-service to arguments against supposing a unique price-output relation (" we agree at once that it "—retail trade—" or for that matter any other industry or trade, has never measured up to the exact and rigorous requirements of the model of perfect competition ") while, in fact, this assumption is required to support their own position.

The authors make certain observations on selling costs. Sales promotion, they say, diminishes the imperfections of the market by spreading information about availabilities : " Sales promotion makes elasticity of demand greater." . . . Since we are going to be asked to agree that greater emphasis on the competitive rather than on the imperfectly competitive character of retail markets implies that these markets are working in the consumers' interest, we must be careful to understand what exactly is the meaning, in this context, of elasticity of demand. In this context, to admit that sales promotion makes elasticity of demand greater, apparently commits one to conceding the argument that selling costs fortify and in no way hinder, the extent to which competition in retailing secures the consumers' interests. The implied argument surely runs : in perfect competition, which never actually exists but which we all think would bring about the sovereignty of consumers' demand, every seller has a perfectly elastic demand curve. Therefore, anything which in actual conditions increases the price elasticity of demand for the product of a given seller, increases the degree of competition in the market and therefore also the approach to optimal conditions. Something has gone seriously wrong with the logic here ; for the argument to carry to the conclusion the authors wish to establish, they must assume the demand curve for the particular article of merchandise plus retailer's service (a tied sale) as neither increased nor diminished as a result of sales promotion. For if the selling costs affect the position of the demand curve, as the theory of imperfect competition supposes, how can it be established that competitive sales promotion, typical of retail markets, is not detrimental to the interests of consumers and how can these authors justify their view that the surplus capacity which selling costs help to engender, is to the consumers' interest ? It would be difficult, however, for the authors to establish that sales promotion does increase the elasticity of demand since all advertising is persuasive in intent and tends to some extent to tie consumers to the advertised brand.

Finally, on this major issue, of whether it is more appropriate to emphasise the imperfections or the perfections of competition, particularly in its price-reducing aspect, at retail, the authors misinterpret at any rate my position and, on my reading of Mr. Smith, his position, too. They refer to the definition of retail markets as imperfectly competitive as an analysis " which appears almost to exclude the possibility of price competition ". My position on whether, in the absence of resale price maintenance, competition will take the form of energetic price competition, depends on a number of factors assumed away in the competitive analysis and brought to light in the analysis of imperfect competition and oligopoly. Such are, to quote two of the most important, the degree of price-mindedness of buyers and the level of employment assumed. What the theory of oligopoly and imperfect competition says is, surely, that price competition is unstable in imperfect markets. Mrs. Hood and Mr. Yamey argue that the insistent demand by many retailers for resale price maintenance and the fact that resale price maintenance is commonly administered, in Britain, anyhow, by retailers and manufacturers' associations in agreement, indicate the strength of price competition in retailing in the absence of restraints. So far so good. But is this not exactly the conclusion to which the analysis of imperfect competition leads us ? The kinked demand curve adds something more (which is unfortunately absent from the analysis of Mrs. Hood and Mr. Yamey), namely that there is no reason to suppose that the price-sales relationship is reversible. If the seller raises his price then there is no reason, unfortunately for him, why his competitors should raise their prices. Surely this is a factor of central importance to the discussion ? If true, it leads to the conclusion that legal restraints on arrangements to maintain resale prices are required if price competition is to survive in retail markets. Mrs. Hood and Mr. Yamey might agree to this conclusion ; it should, however, be recognised as one which derives from the application of the theory of oligopoly to the problems of retail trade. In the competitive market there is no necessity for legal protection of those who wish to vary their selling prices. The authors write : " Though both Mr. Smith and Mrs. Hall are clearly aware of the prevalence of resale price maintenance in Britain, it is difficult to arrive at any other conclusion than that they believe that even without resale price maintenance the inherent imperfections in retailing will in many cases produce results of the same type as those produced by price maintenance ". The points I wish to make are (1) that, in general, the imperfections in retail markets will occasion insistent pressure for arrangements to maintain prices: hence, the fact that almost one-third of the value of retail sales in Britain is under price maintenance arrangements. This is not the same as saying that they will occasion " results of the same type as those produced by price maintenance ". I agree with the authors if they do not know what such results are! (2) That under certain conditions, ardent price competition need not result even though price maintenance is prescribed by law. The attractiveness of using price reductions as a means of increasing sales depends on a number of factors such as the degree of price-mindedness of buyers, the level of employment affecting as it does the expectations of buyers and sellers concerning general price movements and the state of their inventories. The analysis of the dynamic conditions in which price competition in retailing will work in the public interest, which of course includes the profitable conduct of retail business, is urgently important. Very little has been done in this field. Mrs. Hood and Mr. Yamey are right to question the use of static models in the analysis of retail trade. But their own article illustrates the difficulty of choosing a coherent state of hypotheses. For example, their assertion that " newcomers have to provide some inducements to consumers to change their shopping habits and have to adopt some method of making known their presence. The offer of attractive prices is the obvious method, except where retail prices are maintained." This is a misleading generalisation: the attractiveness of using price reductions as a means of increasing sales depends on the factors instanced above. In Britain, long experience of resale price maintenance and government maximum price regulation, in other words, of administered *uniform* prices, has dulled the sensitivity of shoppers to price differentials; prices are frequently not even displayed. There is an emphatic contrast here between the British and the American attitude, though even this comparison is too facile and conceals the important difference of attitude between shoppers, for example, in New York City and shoppers in Ohio and between the attitude of shoppers in the grocery trade as contrasted with the trade in drug store products. It is important to be clear about the assumptions we are making. Furthermore, account must be taken of the level of employment, of general inflationary and deflationary tendencies, before we can roundly assert that the tendency towards price competition in retail markets is of such-and-such intensity. Until the clarification of these assumptions is achieved, it is dangerous to go further than the very limited position of the imperfect competition and oligopoly theorists: that there are no overriding forces at work in retail trade of such a kind as to secure the services the public wants as cheaply as possible. Mrs. Hood and Mr. Yamey indicate some of the problems that require solution but what is needed is a more rapid advance and not, as they suggest, a withdrawal from the theoretical advances of the nineteen thirties.

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II.

By HENRY SMITH

(1) The object of this note is to develop thoughts stimulated by the recent article by Mrs. Hood and Mr. Yamey. (I am surprised that they appear to be unconvinced by the work of Professor Lewis[1] on the spatial aspects of imperfect competition in certain types of retail market, and I regret that in accusing me of complaining without foundation that we lack proof that " there is a direct response to the demands of the consumer expressed in terms of price elasticity "[2] in the development of the retail trades before 1939, they cite neither my own statistical evidence, which establishes a strong presumption of *disproof*,[3] nor that of Mr. R. Bellamy[4] which reinforces my conclusions.)

The problem is to establish how far price competition is effective in retail distribution, when the absence of resale price maintenance sets retailers free to devise their own policy, having due regard to the difficulty of allocating costs between different commodities sold by the same shop, and to the constant flow of new entrants into distribution. "Effective" in this context means that an appreciable flow of trade may be diverted, permanently, from high-cost to low-cost distributors, having regard to the quality of the service provided, by reflecting the low costs in low retail prices, and that this will be the most profitable long-run course for retailers to follow.

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[1] " Competition in Retail Trade : " *Economica*, November 1945.

[2] Henry Smith : *Retail Distribution*, p. 179.

[3] *Ibid.*

[4] *The Pattern of Retail Distribution.* Oxford University Institute of Statistics.

(2) What is common to the problem of retail pricing in all its phases, is the difficulty of imputing costs. In the short run all the costs of the retailer are overhead costs and it is very difficult to ascertain the average prime cost associated with selling any one of the many products which a shop handles in any manner comparable with the capacity of a factory accountant to allocate labour and raw material costs between different products emerging from the same plant. There is thus a tendency for retail pricing to depend upon a mark-up accepted as normal in the branch of distribution concerned. The dynamic problem in respect of retail pricing is, I suspect, to explain how, in the face of change and innovation, what is accepted as the "normal" mark-up itself changes. In the short run, however, given the percentage mark-up normal to the trade and the type of organisation, the retailer seems to have two alternatives. When pricing goods he may consider how far one type of commodity should carry less than the average mark-up, or how far another should carry a mark-up in excess of the average. This is one approach to the problem. It is normally that of a firm which by organisation and policy is committed to carrying a full range of commodities. The second approach is that of the firm whose policy permits it to carry less than a complete range. In such cases it is possible for the firm to decide to handle those goods only which will fit easily into the percentage mark-up at which the firm aims. There is a variant of this alternative which, I think, is sometimes very important. The firm in the former position is asking the question "What shall I sell this for?" The second type of firm, particularly in those trades where, as in certain branches of the clothing trade, there appear in normal times to be certain traditional prices, may very easily be framing its buying policy in terms of saying "How can I best buy hats to sell for a guinea?" And in both cases it is probable that firms will be thinking of relatively long-term considerations associated with the kind of reputation they wish to establish and are saying,

in effect, " Are these the sort of goods we ought to be buying and the sort of prices we ought to be charging in view of the type of trade upon which we wish to concentrate ? "

(3) If price competition is to be generally effective, as defined above, then, assuming for the moment the technique and the degree of service offered by retailers to remain unaltered, the lowest price for any given quality or the highest quality of merchandise for any price must be proved to attract custom over an appreciable range, so that there will be a constant downward revision of the "standard" mark-up in each trade, or branch of trade, until a minimum compatible with effective operation is reached. This will, of course, not be the case if custom is found to be more readily attracted by the use of loss leaders (here defined as the sale of goods below a figure at which they can be reasonably assumed, on the most elastic interpretation of the term, to be carrying their share of overhead costs) than by changes in the general range of prices of the firms concerned.

(4) If the level of service offered is altered (which, in the case of convenience goods, may be effected by a mere change in the number of retailers, as the location of the shop is one of the " services " provided) the effect of price competition will show itself in the provision of the best standard of service for any given price. But it is not only in respect of the location of retailers that the degree of service offered to any range of competitors by any shop is specific to them and to it. In the short run the degree of service provided by a shop depends upon the familiarity of its staff with specific customers' requirements. It is, therefore, very difficult indeed to think of changes in the standards of service *not* being associated with changes in the degree of monopoly in the branch of retailing concerned. Given the different standards of actual and potential service offered, however, on the assumption that the two can, in fact, be compared by customers, the consumers will choose between the standards offered at different prices or the same price.

This argument mainly applies to convenience goods. In this field the chain stores and co-operative societies are strong. The chain stores in this field mainly provide standard services, offer a narrow range of goods and are reluctant to operate in areas which do not offer a minimum turnover. They probably have (or had before the war) a considerable effect on urban retail prices for the goods normally falling within their range. But by "creaming" lines and areas in this manner, will they not tend to render fewer and thus less competitive *inter se* the more fully stocked type of food shop, and is their price policy not marked by a free use of loss leaders ?

(5) The co-operative case is even more interesting. There is little doubt that in practice most co-operative societies work to a dividend policy. The normal rate of dividend is, I suspect, always present in the minds of their executives and is not a pure resultant. This, therefore, would appear to tend to lessen their effectiveness as competitors in general. They do not seek to maximise a global surplus after the manner of a private trader who seeks to maximise his profit, but rather to maintain a pre-determined level of *average* surplus, thus being inhibited from seeking marginal business which, while adding to the global surplus might lessen it as an average of sales. In this context one must ask, "Is co-operative dividend in effect the equivalent of a cut in the prices ? If it is not, then the circumstances cited above would seem to render co-operative trade a factor lessening the effectiveness of price competition in retailing. If it is, then if price competition is really effective, why does not the co-operative movement grow much faster than it has done ? Few co-operative societies pay a dividend of less than 5 per cent. on sales, or something between a third and a quarter of the normal margin on those commodities which co-operatives usually handle. It may be argued that their standards of service are often somewhat lower than those offered by other types of retailer, but are they 33⅓ per cent. lower ?

In the case of shopping goods, there is a tendency for the shops concerned to congregate together in shopping centres and even for special branches of trade to concentrate on particular streets in big towns. Consequently it is easier for consumers to compare prices. How far, however, in these trades, is the average consumer likely to be an adequate judge of the relative qualities of goods seldom purchased, or of the cost of distributing the goods concerned ?

(6) In these circumstances I think that it is not unreasonable to assume that one's approach to the effectiveness of price competition in retail trade must be an empirical one.

In some branches of retail trade I think that price competition is moderately effective and, given appropriate changes in the structure of commercial law such as I have advocated elsewhere, particularly in my pamphlet *Wholesaling and Retailing*, could be rendered much more so. In others I think there is little doubt that it is less than effective and is likely to remain so. This does not mean that I am aware of any better way in which retail trade could be organised, or that I think one can argue as precisely from cause to effect in *any* monopolistic markets as one can in perfectly competitive ones. The moral is that here one's evidence, whether making judgments on welfare or stability grounds, must be specific and empirical and may have to be applied in the light of common sense. If pressed to define the latter I would do so by saying that the appropriate criterion is one capable of being put into non-technical terms and exhibiting sufficient weight in one direction to be agreed upon by any group of reasonably intelligent persons in public life.

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Competition and Prices: A Study of Groundnut Buying in Nigeria

By P. T. Bauer and B. S. Yamey

I

There are many difficulties in the way of systematic statistical enquiry into the influence of numbers of firms on prices. Most of the difficulties have their origin in the familiar problem of finding situations in which all other factors are constant except the one under investigation.[1] A special difficulty is that of defining and delimiting a particular market and of counting the number of firms operating in it; buyers and sellers located in a geographical area may have (and indeed usually have) access to sellers and buyers outside the area. The numerous obstacles probably explain the apparent paucity of statistical studies of this aspect of price behaviour in spite of its wide relevance for economic theory and policy.

In the course of a general study into the economics of trade in British West Africa it emerged that the organisation and circumstances of the groundnut trade in Nigeria presented an exceptional opportunity for a systematic statistical enquiry into the influence of the number of firms on market prices. This article collates information of the numbers of groundnut buyers and of prices paid for groundnuts in different regions and centres, and analyses the findings.[2]

II

Groundnuts in Nigeria are produced in two geographically distinct regions. Approximately 92 to 95 per cent. of the total purchases for export is produced in the so-called

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[1] It may sometimes be possible to allow for changes in other factors by means of correlation analysis. However, in the field of price behaviour many of the influences operating in a market cannot be expressed quantitatively.

[2] A comparison of this nature on a small scale has been presented by Professor Hancock in the celebrated chapters on West African trade in his *Survey of British Commonwealth Affairs* (Vol. II, Part 2, Chapter 2). Professor Hancock has compared groundnut prices ruling in the towns of Kano and Baro in Nigeria over a number of pre-war years; and from the findings he suggests that the larger number of traders in Kano secured higher prices for producers than in Baro where only two firms operated. Professor Hancock's pioneer effort related to a comparatively small sample and to somewhat fragmentary price statistics. He therefore advanced his conclusions tentatively. The comprehensive comparison set out in the following sections overwhelmingly confirms Professor Hancock's findings.

Northern or Kano area, while the balance is produced in the Rivers area (or Upper Niger-Benue area). The two areas are divided by large and thinly populated stretches of country. In the periods covered by the investigation groundnuts were not moved either by producers or traders from one area to the other. The produce of both areas is exported by the Nigeria Groundnut Marketing Board, a statutory monopoly, and is bought on its behalf by trading firms which act as its licensed buying agents. In the season 1948–49 there were seventeen licensed buyers operating in the Northern area and in 1949–50 there were twenty-one. In the Rivers area there were only two firms buying for the Board; both of these firms also operated in the Northern area.

The licensed buying agents make their purchases either through middlemen acting for them on a commission basis or through their own clerks who are employees and are generally remunerated partly by salary and partly by commission. The middlemen have their own network of sub-middlemen. A particular firm may have a clerk employee and also one middleman (or even more) operating on its behalf in the same locality. To some extent the clerk and the middlemen or their sub-middlemen may be in competition with one another although ultimately buying for the same firm. The clerks are generally in charge of retail stores as well; at out-stations produce buying is merely one of their activities. The buying " establishments " of middlemen are generally very simple and usually temporary. In the Rivers area the two buying agents purchase through clerks only and do not employ middlemen.

Each season the Groundnut Marketing Board prescribes statutory minimum prices to be paid for purchases at a large number of designated markets (gazetted stations) spread throughout the groundnut producing areas. In the Kano area the structure of minimum prices pivots on the uniform price prescribed for all railway stations.[1] In 1949–50 the railway line price was £21 4s. per ton. In the Rivers area the structure pivots on two basic prices payable along the rivers; the difference in the two rivers prices (£1 per ton in the period under review) is to allow for the approximate differences in the cost of shipment to the ports. In 1949–50 the two basic rivers prices were £20 and £19 per ton.

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[1] The Nigerian railway charges a flat rate for the movement of groundnuts throughout the Kano area.

At buying stations away from the railway line or the rivers (i.e. at road stations) lower minimum prices are prescribed to allow for the cost of transport to the railway or river stations; the difference is known as the transport differential. In a number of road stations in the Kano area the gazetted minimum prices are fixed at higher levels in relation to the basic price at rail stations than would be warranted by the officially calculated transport differentials. This is designed to encourage production in outlying areas. The licensed buying agents receive for purchases at these stations (subsidy stations) so-called transport subsidies from the Board designed to cover what otherwise, on official calculations, would be losses to them.

The buying agents receive from the Board no more than the relevant minimum prices[1] for the tonnages bought. They also receive certain tonnage payments known as "block allowances" to reimburse them for their expenses and to remunerate them for their services. In 1949–50 this block allowance was £4 10s. 6d. per ton for the Kano area and £4 17s. 9d. for the Rivers area. The principal items include the cost of bags, interest, insurance and other finance charges, an allowance for overhead expenses, middlemen's commission and the agents' remuneration. In 1949–50 middlemen's commission was allowed for at 14s. a ton on all purchases in the Kano area. There was naturally no similar item in the Rivers area; but the overhead allowance was raised by over 13s. in recognition of the fact that all purchases were made through the salaried clerks of the trading firms. The licensed agents' remuneration was 8s. 6d. and 7s. 8d. per ton in the Kano and Rivers areas respectively. This was 2 per cent. of the basic price. There is no item for transport costs in the block allowance, since the transport differentials and subsidies are deemed to cover the transport expenses of the firms from the road stations to the railway line or the rivers.

The block allowances in the two groundnut areas are settled by negotiation between the Marketing Board and the licensed buying agents. There is no reason to believe that they are less generous in the Rivers area than in the Kano area. The absolute level is higher in the Rivers area in acceptance of the claims of the buying agents that their costs are higher. Within the total allowance the overhead items are both absolutely and relatively larger in the Rivers area.

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[1] For purchases at the subsidy stations the buying agents in addition receive payments to compensate them for the officially calculated loss which they are assumed to incur by paying the prescribed subsidised prices.

III

Although a fair number of buying agents operate in the Kano area the organisation of the trade might suggest that little buying competition would take place there. First, in 1948–49 sixteen of the seventeen agents were members of a confidential market-sharing syndicate; in 1949–50 sixteen out of twenty-one were members of the syndicate. In both 1948–49 and 1949–50 the combined share of members of the syndicate in total purchases was over 90 per cent. The syndicate operates along familiar lines. Members of the syndicate are allotted quotas (shares) and those who purchase more than their quotas make penalty payments to those who are underbought.[1] Secondly, there is a marked degree of concentration in groundnut buying; three of the licensed buying agents handling between one-half and three-fifths of total purchases are financially linked, though their operations locally are largely independent. Thirdly, with quantitatively negligible exceptions all licensed buying agents are European and Levantine (i.e. non-African) firms or traders who operate with substantial capital and who possess a large measure of commercial skill; and their middlemen are in many cases non-African. They buy from customers (producers and small African traders) who in the great majority of instances are illiterate, have little capital and are geographically dispersed.

From these considerations it might well be inferred that price competition, or indeed any form of buying competition, would be negligible in spite of the apparently large number of licensed buyers. In short, it might be expected that the intensity of buying competition in the Kano area would not be materially different from that in the Rivers area, where only two buyers operate.

The broad reasons for the small number of traders in the Rivers area are fairly clear. The area is comparatively poor, undeveloped, sparsely populated and backward. It is therefore not an easy market for traders to enter. However, the comparative backwardness has not been the only deterrent to entry into a region where it is known that trading is distinctly profitable. One difficulty is that the cheapest method of transport, river shipping, is owned by the two trading firms established in the area. These two firms have developed river shipping and have traded in the area for many years. It would be costly and possibly impracticable for a new trading firm to develop its own river shipping services, while reliance upon the services of the established river lines would increase the risks and inconveniences of trading. Some other firms have recently investigated the possibility of establishing themselves in this region and are likely to start operations in the near future.[1]

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[1] The penalties approximate to the difference between gross receipts and the short-run avoidable (or escapable or prime) costs of purchase.

IV

There has been a substantial measure of buying competition in the Kano area for many years past in spite of confidential buying syndicates and other influences tending to discourage it. Even during the war there was still buying competition in the Kano area despite an officially established and administered system of buying quotas with fines for overpurchases; moreover, new firms were not allowed to buy produce. The statutory minimum producer prices, which from 1942 to 1946 ranged from £6 to £16 per ton at rail stations, were frequently and increasingly exceeded. At first overpayments were of the order of a few shillings per ton, but by 1946 overpayments of 40s. and 50s. per ton were frequent in outlying road stations where the minimum prices were appreciably lower than those fixed for rail stations. These overpayments were particularly large in areas where there were wide transport differentials or where transport subsidies were paid.

Overpayments have been widespread since 1947; and more specific as well as more comprehensive information has become available on this subject, chiefly because, for administrative reasons, more detailed data have been collected of the prices actually paid at a large number of stations. Sufficiently detailed and consistently compiled information is available for 32 road stations in the Kano area, at which about two-fifths of all groundnut purchases were made in 1948–49 and 1949–50.[1]

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[1] Information on the volume of groundnut purchases at individual markets in the Rivers area seems to suggest that the number of firms operating in them is not limited solely by the extent of the market. In many markets in the Rivers area the volume of groundnut purchases per firm is much greater than the corresponding averages at many markets in the Kano area (including many stations in outlying districts where nevertheless several buyers operate). Moreover, substantial quantities of cotton, benniseed, ginger and shea nuts are also brought to markets in the Rivers area.

In 1948–49 there was a good harvest and in the following year the crop was short. Wherever the information is available the investigation covers both years to allow for the possible influence of the size of crop on the intensity of competition. In fact this influence appears to have been small.

The principal statistics relevant to the present investigation are presented in the following table :

GROUNDNUT PURCHASES AND OVERPAYMENTS AT THIRTY-TWO ROAD STATIONS, NORTHERN NIGERIA, 1948-49 AND 1949-50.

	1948-49	1949-50
Total groundnut purchases in Kano area ..	315,000 tons	178,000 tons
Groundnut purchases at the 32 road stations	119,000 tons	76,000 tons
Average number of firms represented at the 32 road stations[2]	6	7
Statutory minimum price at railway line ..	£19 4 0 per ton	£21 4 0 per ton
Average prescribed minimum price at the 32 road stations[2]	£16 19 9 per ton	£19 3 0 per ton
Average price paid at the 32 road stations[2] [3]	£18 0 1 per ton	£20 8 8 per ton
Average overpayment at the 32 road stations[2]	£1 0 4 per ton	£1 5 8 per ton
Range of overpayments at the 32 road stations	From 1s. to £3 10 0 per ton	From 1s. to £4 5 0 per ton

In both years the gazetted minimum prices were exceeded at every station. The highest overpayments were recorded at road stations where the gazetted minimum prices were lowest and where, therefore, the transport differentials, usually augmented by subsidies, were greatest ; in 1948–49 overpayments of £3 10s. were frequent at stations where the minimum prices were slightly over £13 per ton.

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[1] The prices were collected partly by the authorities and partly by the licensed buying agents. They were estimated in part. Each price represents a simple arithmetic mean of a more or less continuous series of recorded prices containing a large number of successive items. Though the figures are imprecise and in a sense incomplete they are close approximations ; they are independently confirmed by trade and official opinion. A personal test check in December 1949 at two stations broadly confirmed that the ruling prices were in accordance with the recorded data.

[2] Weighted by volumes of purchases at each station.

[3] For 1948-49 the prices paid are the averages for the whole season ; for 1949-50 they refer to the first half of the season by which time rather more than one-half of the crop had been bought. For various reasons overpayments tend to be larger in the second half of the season, chiefly because greater competition among the owners of transport leaves the buyers with a more generous real allowance on transport differentials. Thus, if anything, the 1949-50 figures tend to understate the extent of overpayments.

V

The presence and the extent of the overpayments are themselves significant; and they gain in significance when contrasted with the position in the Rivers area, where there were only two licensed buying agents. With one interesting but quantitatively negligible exception[1] there has been no record or suggestion of overpayments for groundnuts by licensed buying agents or their representatives in the Rivers area during or since the war. The statutory minima have been observed but have nowhere been exceeded. This is undoubtedly due to the absence of competition and not to the lack of available margins, which, given competition, would have been competed away in favour of sellers. In the Rivers area four-fifths of the tonnage was bought in 1949-50 at buying stations at which only one or other of the two firms was operating. For this large portion of the area informal market sharing by means of zoning was in effect in force.

VI

It would have been interesting to investigate the correlation between the extent of overpayments and the numbers of buyers at each road station in the group analysed in the preceding section. Unfortunately the available data cannot be used for this special purpose. The amount of the overpayment depends not only on the extent of competition but also on the margin available to be competed away in the form of overpayments. This margin is not the same at each road station principally because it is greatly influenced by the difference between the officially recognised transport differential (and subsidy where this applies) and the actual transport costs incurred.[2] Sufficiently detailed information of actual transport costs incurred in the two seasons is not available.

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[1] In one period during the war members of an obscure African tribe, the Kakanda, who engage in canoe trading on the Benue, outbid the licensed buyers at certain up-river stations. They bought groundnuts at these stations above the gazetted minimum prices, took them down the river and sold them either to licensed buyers at the higher gazetted prices prevailing on the lower reaches of the river or sold them at Onitsha for local consumption. These activities were stopped by administrative regulation.

[2] Generally speaking, the margin available to be competed away was greatest at the outlying stations, especially at the subsidy stations where the transport differential and the subsidy together in some cases exceeded £9 per ton. On the other hand, at road stations near the railway line the differential was only a few shillings. Thus even though there might have been a large number of buyers operating under keenly competitive conditions at road stations near the railway line, the overpayments would perforce have been less than at the more remote stations with fewer buyers but larger transport differentials.

However, there is some information, more limited in scope but of considerable interest, of prices paid in 1949–50 at nine buying stations on the railway line.[1] The figures are tentatively advanced, but it is most unlikely that any errors they may contain would significantly alter the conclusions they suggest.

In 1949-50 24,000 tons were bought at these stations, which was about 15 per cent. of total purchases in the Kano area and 45 per cent. of total purchases at rail stations. At all these stations the gazetted minimum price was £21 4s. per ton. As there were no transport differentials or subsidies, the prime costs of buying groundnuts were about the same at each station; hence the margin which could be competed away was also much the same at each station. The major influence vitiating the comparability of overpayments at different road stations was absent.

Information on buying operations at the nine railway stations is shown in the following table:

GROUNDNUT PURCHASES AND OVERPAYMENTS AT NINE MARKETS ON THE RAILWAY LINE, NORTHERN NIGERIA, 1949–50.

Station	Number of licensed buying agents[2]	Average overpayment in shillings per ton	Tonnage bought	Average tonnage per buying agent
A	1	0	1,196	1,196
B	2	0	666	333
C	2	0	1,412	706
D	2	10	1,968	984
E	3	11	3,107	1,036
F	4	6	1,975	494
G	6	16	2,885	481
H	7	6	2,756	394
I	10	20	8,967	897

There were overpayments at six of the nine markets along the railway line. Moreover, the data suggest very strongly that the extent of overpayments is much influenced by the number of traders present. There were only one or two buying agents represented at the three stations at which no overpayments were recorded. At the other end there were three stations at which six or more buying agents were represented and two of these had the heaviest overpayments.[1]

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[1] This information was kindly collected by the produce department of the United Africa Company in Kano.

[2] The numbers of middlemen and clerks operating in different localities tend to be proportionate to the number of licensed buying agents. The degree of competition among the clerks and middlemen is largely influenced by the number of licensed buying agents and the market positions of the latter. *Cf.* also section VII below.

But numbers of traders alone do not give a full picture of the degree of buying competition at the different stations. It may be expected that, apart from numbers, the intensity of competition would depend upon various other factors, some of which cannot be expressed quantitatively. These would include the presence of newcomers trying to force their way into the trade generally or into the particular trading centre, and the presence of firms outside the buying syndicate. A further factor may be the presence of firms without extensive organisation in the particular area who might therefore have to a greater extent to rely on price inducements to secure supplies. A racially heterogeneous group of traders comprising Europeans, Levantines and Africans is likely to behave more competitively (even despite agreements) than a homogeneous group of the same size, as the contacts between members are likely to be less continuous and smooth. In addition, Levantine firms tend to be more individualistic in outlook and behaviour.

The influence of competition on prices becomes even clearer when the figures in the table, which by themselves are instructive, are subjected to qualitative analysis. Thus station D, which at first sight appears to be an exception, falls into place; for here a newcomer, who was not in the syndicate, had entered the market for the first time in that season and had moreover to contend with the difficulties of a late start in the season. Qualitative analysis also clarifies the position at E. One new firm, again not a member of the syndicate, entered the market here. This firm is a comparatively recently established Levantine firm with no extensive organisation. The comparatively modest overpayments at F and H coincide with the absence of firms outside the syndicate. At F, with one exception, only large established European firms operated; the exception was a Levantine trader financially linked with one of the large European firms operating there. Six of the seven firms which operated at H are the largest members of the syndicate, three of which are linked financially. The situation at I is one of some interest in that all ten firms which operated there were members of the buying syndicate, but four of them were comparatively small firms including three Levantine enterprises. Substantial overpayments occurred here even though all buyers were members of the syndicate.

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[1] The coefficient of correlation between numbers of buying agents and average overpayments at the nine stations is +0.76.

A study of the entries in the last column of the table (average tonnages per buyer) suggests that differences in overpayments were independent of the scale of operations as measured by average volumes handled. There is evidently no correlation between the average tonnage purchased per firm and the size of overpayment.

The statistics of this section, although on a small scale, suggest several conclusions. They confirm that the emergence of competition under apparently unpropitious circumstances has resulted in substantial overpayments; and they suggest that these overpayments are largely a function of the intensity of competition. They suggest that the number of firms is an important element in the competitive situation; and that even small numbers may result in a substantial measure of price competition. But numbers alone do not provide a full explanation; qualitative assessment is also necessary. Here the role of new entry and of the composition of the group of competitors appear to have been particularly important.

VII

It is easier to discover the beneficiaries of the overpayments than it is to determine who bears their cost. The statistics of actual prices in the preceding sections refer to prices paid by middlemen and clerks of licensed buying agents to producers or to those petty middlemen, not affiliated to any licensed buying agent, who bring produce to the buying stations. As the unaffiliated petty middlemen are members of the rural community and in many cases are themselves producers, the overpayments represent additions to the income of the agricultural community.

The heaviest overpayments since 1942–43 (when they were first recorded) have occurred in the comparatively distant Bornu province. In 1949–50 the overpayments at the principal buying stations in that province were of the order of £3 to £4 per ton on a basic minimum road station price of about £16. In this area the officially calculated transport differentials and subsidies are high and have in effect provided the main source from which competition has produced overpayments. The actual transport rates between the principal Bornu buying stations and the railway line tend to be far lower than the figures assumed in the calculation of differentials and subsidies. In 1949–50 the officially calculated transport costs from the principal buying stations to Kano were of the order of £10 per ton, while the actual costs were about £4 per ton. The main reason for the low actual costs was the cheap rate quoted by owners of lorries returning with little cargo from the Lake Chad area to which large consignments of merchandise had been conveyed.[1]

The groundnut producers of Bornu are not only generally illiterate but are among the most backward sections of the peasantry of northern Nigeria. According to the views held in some influential circles the "bargaining position" of these producers *vis-à-vis* a handful of generally well financed and organised alien traders, frequently acting in concert, would have been extremely weak. Yet so far from being exploited by the so-called rapacious alien and other middlemen, competition amongst buyers has secured for them prices far in excess of the minima laid down for their protection.

Overpayments represent the surrender by those participating in the trade of part of the incomes and reimbursements provided for in the official structure of prices and block allowances.[2] They are made in order to secure additional supplies and are enforced by competition upon the licensed buyers, and/or their clerks and/or their middlemen.

It is not possible to determine precisely how the burden of any particular overpayment has been shared by the buying agents, their clerks and their middlemen, who are all members of the urban community. However, the magnitude of overpayments at rail stations, where the basic minimum price is payable (i.e., where there are no transport differentials and subsidies) makes it clear that in many cases a share of the burden is carried by the licensed buying agents themselves;

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[1] This traffic was not peculiar to 1949–50. In recent years groundnuts appear to have been carried from Bornu to Kano or Jos for about 2½ pence per ton-mile, which is remarkably low for an area with a poor road system about a thousand miles from the ports.

[2] It is conceivable that overpayments and out-of-pocket expenses might in some cases together exceed the gross receipts allowed for by the prescribed price structure.

In the multi-product firm some branches of activity might be carried on at a (notional) loss for the benefit of the business as a whole. In groundnut buying there is some evidence that middlemen occasionally "lost" on groundnut buying but continued in the trade because of market opportunities in the related grain trade.

some of the overpayments exceed the gross commission payable to middlemen.

VIII

Although this article is concerned with the influence of the number of traders on the prices received by producers, it would be misleading to neglect other advantages derived by producers and rural middlemen from buying competition among licensed buyers and their employees and middlemen ; the benefits of competition are not confined to overpayments.

Local executives of the merchant firms acting as buying agents frequently wish to secure additional tonnage without making overt overpayments, which may meet with displeasure from senior executives. Additional purchases may be secured without actual overpayments by selling equipment and merchandise to favoured middlemen or petty middlemen at prices lower than the prevailing market prices. An important special case of this practice is the favourable allocation of price-controlled (so-called short-supply) equipment and merchandise to these customers. Other concessions take the form of permitting the use of premises at nominal rents or the granting of advances or of trade credits for long periods.

Wherever possible clerks prefer to secure additional tonnage by means of valuable concessions rather than by undisguised overpayments. Such concessions are not at the expense of their own commission or salary, and can be made at the expense of their firm without requiring specific approval from their superiors. As clerks generally sell merchandise as well as buy produce, they are able to favour valued customers on a small scale and so to secure tonnage.

Indirect concessions rather than increased overpayments to secure tonnage competitively may be preferred by the firms for another reason. Some of these concessions can, at least for a short period, be restricted to a limited number of selected customers (who are also suppliers of groundnuts) whereas overpayments must generally be granted to all comers as knowledge of them tends to spread more quickly. Moreover, even where the granting of the concession cannot be concealed the differential treatment is less likely to cause resentment than differential overpayments since certain concessions (such as the use of premises on favourable terms) in their very nature cannot be made to all customers.

The presence of a number of firms is in itself of value to the producer by reducing his dependence on individual firms or their intermediaries or employees and by providing more buying stations closer to individual producers. This is of some consequence in such vast regions as the groundnut producing area of northern Nigeria.

IX

The results shown here of competition in produce buying bear on a wide range of topics in economic theory, in administrative practice and in discussions of the reform of marketing. We do not propose to consider these here. The purpose of the article has been limited to the presentation of the results of an " experiment " in the field of competitive behaviour.

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The Value of Bonus Issues

By MARGARET RIX

The principles of bonus share issues have been largely hidden by the irreconcilable character of two attitudes—the social, which maintains that such issues are valuable, and the investment, which claims that bonuses do not involve any true gain not available by other existing means. There seems need, therefore, for a theoretical study which will, after explaining the nature of bonus issues and the theory of their market behaviour, set out briefly the opposing arguments, describe the apparent effects of the capitalisation of profits upon the company and above all upon the individual shareholder, and then arrive at some independent conclusion.

1. THE NATURE OF BONUS ISSUES

Ignoring all variations, an issue is described as a bonus when holders of a particular class of share in a company are offered as of right additional shares of the same class in a fixed ratio, either at a fixed price (when it is an " issue on bonus terms ") or free.

A free bonus is a limiting case, being an issue where the consideration payable by the shareholder is nil, as it is provided out of the company's reserves. At the other limit, the consideration for a new share must always be less than the market price of the old shares, because the market price is one paid by a marginal buyer and applies only to that small fraction of the company's capital which is changing hands at the moment. If the whole of a new issue for cash is to be subscribed, the price must be such as to induce *all* the members or their assignees to take up the allotment, and must therefore be cheaper to members than that payable by a marginal buyer of the old shares. (The purchaser of new shares at a premium over the issue price then becomes the new marginal buyer.) In 1947 this theoretical principle was apparently overlooked in the Budget proposals for a Bonus Duty, but recognised in the ensuing 1947 Finance Act[1] in the form of an exemption limit. The Capital Issues Committee have always accepted the need for some margin, if an issue is to be successfully floated.

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[1] 10 & 11 Geo. 6. Ch. 35 (Sections 60–62). The wartime ban on free bonuses was lifted when the Bonus Duty was imposed.

It is an essential consequence of a bonus that the old and new shares become eventually of one class, having of necessity a common price. Since to an existing member the new shares must always cost less than the old, the value of the new shares must rise and that of the old shares fall to the new common level. Or if the new shares happen to rise above the original price of the old, the latter will rise less; and if the new shares fall below the issue price, the old shares must fall still further.

Hence a prospective gain (realised or not) on a member's new shares is accompanied by a prospective unrealised loss on his original holding. The Bonus Duty of 1947 completely ignored the effect of a new issue upon the value of the original shares. Owing to this fundamental misconception the tax did not work as intended and was withdrawn in the 1949 Budget.

2. The Theory of Market Behaviour

The actual course of events and the theory underlying it can be best followed with the use of symbols. A company has x shares outstanding, and then issues an additional rx shares, offering them in the ratio r to existing members. No less than four different prices or values are involved, and two of them can be subdivided:

> v_1, the price or series of prices (including the right to subscribe to the new issue) at which x shares stand immediately before the issue is announced or at any time between then and the day the old shares are quoted ex rights;
>
> v_2, the price at which the rx shares are offered; this can be zero, or anything less than v_1;
>
> v_3, the calculated equalised value for the $x(1 + r)$ shares when they have become one class; it is a function of v_1, r and v_2 being fixed and v_1 variable;
>
> v_4, the actual price or series of prices at which $x(1 + r)$ shares are quoted when they have become of one class. This price is entirely a question of fact, which is influenced but not determined by v_3.

The market defines the rights per old share as the amount by which each of x shares will fall to the calculated common value. This amount is v_1-v_3, or

$$\frac{r}{1+r}\,(v_1-v_2) \quad \ldots\ldots\ldots\ldots\ldots \quad (1)$$

And the premium (sometimes also called the "rights"[1]) on each of rx shares is the amount by which each new share should rise to the common level and is v_3-v_2, or $1/r$ times the rights per old share, or

$$\frac{v_1-v_2}{1+r} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

These technical calculations do not unfortunately help to decide whether a member receives any benefit from a bonus, since they are derived from the expression

$$xv_1 + rx\,v_2 = xv_3 + rx\,v_3$$
$$\text{or } rx\,(v_3-v_2) - x\,(v_1-v_3) = 0 \quad \ldots\ldots\ldots\ldots \quad (3)$$

The argument is in fact circular, the market regarding v_3 as the equalised price per share for the increased capital, such that there will be neither gain nor loss on the old and new shares combined.

Now an actual gain can arise only where $v_4 > v_3$. While in completely unvarying market conditions v_4 tends to equal v_3, there is no rigid connection, as the two amounts refer to different times in a market whose normal tendency is to fluctuate, and v_3 is itself a variable sum. In considering the difference in market price before and after completion of the issue, it can only be roughly estimated and not arithmetically deduced how much of v_1-v_4 is v_1-v_3 and how much is due to ordinary market action. Meanwhile v_1 does not remain unaffected by the new issue terms ; it tends to move in such a way that corresponding readings of v_3 give the anticipated value of v_4, taking account of the consequences of the issue such as its probable effect on earnings and dividend policy.

Thus when the transition is over, the fact v_4 replaces the calculated amount v_3, and the result to members[2]—on paper, for the profit or loss is not actually realised—is

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[1] The results of (1) and (2) are not the same, and the customary ambiguous use of the word "rights" is unfortunate. The rights per old share have no separate existence and are used chiefly to arrive at the prospective amount of v_3. The rights to the new shares are usually in the form of renounceable and therefore saleable Letters of Right or Provisional Allotment Letters, the seller receiving a premium over and above the amount (if any) paid up on the new shares.

[2] Any intention of hinting that the ensuing formula is a suitable basis for taxation must be disclaimed. The situation would be impossible if a company were taxed on the unrealised market appreciation of a whole class of its capital over an arbitrary period of time, just because it happened to make an addition to that class.

$$rx\,(v_4 - v_2) - x\,(v_1 - v_4) \quad \ldots\ldots\ldots\ldots \quad (4)$$

This may be either positive or negative, whereas substitution of v_3 for v_4 gives by definition a zero result. The 1947 Bonus Duty was 10 per cent., payable by the company, of $rx\,(v_4 - v_2)$ if positive, and taking the first available quotation; issues where v_4 did not exceed 105 per cent. of v_2 were exempt.

3. The Social Point of View

On this argument, the sale of rights to the new shares causes a gain of $rx\,(v_4 - v_2)$. This extremist view[1] ignores (as did the 1947 Finance Act) the quantity $x\,(v_4 - v_1)$ which is usually but not necessarily negative, although it is literally impossible for the bonus shares to rise to a new equalised price without the price of the old shares falling to meet them, or at any rate to rise less than the new shares.

A less extreme opinion would say merely that the expression (4) often gives a positive result in practice, as there is a tendency for $v_1 - v_4$ to be very small. This is because where earnings are at least $1 + r$ times the old amount of dividend, the old rate can be paid on the larger capital even when the bonus is free. (With issues on bonus terms the probability is greater, as the company earns extra revenue from investment of the new issue proceeds.) Thus where the rate of dividend is maintained on more capital,[2] v_4 tends to approach v_1. Shareholders can take a tax-free capital gain on rx shares and still have the same amount of income as before from x shares.

Finally, antagonists of bonus issues fall back on a general question, the force of which should not be underrated. If it has no value, why is a bonus issue ever made? The search for another name[3] shows that some inconsistency is seen between the investment point of view and use of the word "bonus".

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[1] See *Hansard*, Vol. 436, No. 83 (April 15th, 1947), cols. 82–3.

[2] The three-year control of dividends proposed in Cmd. 8318 (July, 1951) would not in general have permitted this, if the bonus were free. The effect of dividend limitation is omitted from the present study, as it has no bearing on the principles of bonus issues.

[3] See *The Investors' Chronicle*, January 27th, 1951; also *The Financial Times*, February 7th, 1951.

4. The Investment Argument

The investment argument[1] is, in brief, that any apparent profit on a bonus issue is not attributable to the bonus as such, being equally attainable by other existing means.

It is held quite correctly that a free bonus, being only a transfer from reserves which are part of the equity to nominal share capital which is also part of the equity, is a book entry having no effect whatever on the total, or on the company's earning power, assets or prospects. That being so, it is contended (in contrast with the social argument) that v_4 is unlikely to exceed v_3 and to approach v_1 in the case of a free bonus. Paradoxically, the larger r is, the smaller is the probability, for the smaller is the chance of the company being able or willing to maintain the old rate of dividend on $1 + r$ times the old capital.

There would be general agreement that some free bonuses and most issues on bonus terms raise the presumption that the company intends to maintain its former rate of dividend. But the investment argument holds that a higher amount of dividend could have been paid equally well by increasing the rate on the old capital. Also the value of a share does not depend only on the rate of dividend; any tendency of v_4 to rise towards v_1 because the old rate of dividend is kept up would be counteracted at least in part by a tendency to fall because a higher proportion of earnings than before is to be distributed. It ought, however, to be conceded that a higher market price is normally obtainable for the right to a given annual income if distributed than to the same sum if retained by the company.[2] Any gain from a higher distribution is apt to be greater than the loss arising from the reduction in retained earnings. Hence an increase in both the amount and proportion of earnings distributed tends on balance to raise aggregate market values, although in a smaller degree. Such gain, however, arises primarily from the increased amount of dividend, and could be obtained without any bonus issue.

If a shareholder wants only to maintain his former income and sell his interest in rx shares, the bonus as such is not clear gain, for he is thereby surrendering part of his share in the equity. A holder of one share originally had $1/x$ of the equity, and if he sells his rights he has left only $1/x(1 + r)$. Thus any profit on rx shares does not arise specifically from the bonus, but could have been obtained equally well by a sale of $r/(1 + r)$ of each holding if there had been no bonus.

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[1] *The Economist*, May 10th and June 21st, 1947; also H. Wincott in *The Banker*, June, 1947.

[2] L. D. Gilbert, "Management and the Public Stockholder" (*Harvard Business Review*, July, 1950). But see correspondence in *The Economist*, June 14th and 21st, 1947.

A special case occurs where a shareholder has the right to take up free or for cash new shares of some other class altogether or of some associated company. The value of the new securities less the consideration might seem to be clear gain; but some relative loss in value can arise at one or more removes on the old shares. For the ultimate value of the combined undertaking will be less than it would have been if the new securities had been issued to the public at their highest possible price.

5. The Company and its Public Relations

A number of factors concern a company and its relations with investors which, because of their psychological importance, have an indirect bearing upon share values though they have nothing to do with the intrinsic advantages of bonus issues. Any action which, logically or not, improves public relations is of some benefit to the company, and may therefore tend slightly to increase aggregate market values.

With issues on bonus terms, it is in the company's interest to raise capital as at high a price as possible, and for v_2 to be close to v_1. On the other hand attempts to cut the margin too fine lead to difficulties where the terms are decided long in advance of allotment and the normal market trend of v_1 turns downwards in the meantime. Where v_1-v_2 is large (this difference usually being called the "bonus element"[1]) the company on the face of it wishes to maximise the realisable gross profit to individual members of $rx(v_4-v_2)$, although there is a consequential reduction $x(v_1-v_4)$ in the unrealised value of the old shares. It is plausible, though it cannot be established theoretically, that activity in a company's shares is stimulated if the crude bonus element appears to be large, regardless of the real consequences of the issue.

With free bonuses, it is only rational by means of a transfer from reserves to make the nominal equity capital appear to be what it has in fact become, wherever profits have been converted into real capital by being retained in the business over a period.

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[1] This is another common ambiguity, an alternative definition being v_4-v_3, as in the *Financial Statement* (1947–48).

It can be argued that asset values are impermanent and might have to be written down at some future date, with a consequent reduction in nominal capital if there are insufficient reserves. It is, however, an accounting and not a theoretical problem to decide how much of reserves can safely be capitalised and how much should be left to absorb future fluctuations in asset values. It is undoubtedly of some small indirect benefit to restore a better balance where share capital has become out of line with net assets, for it is misleading to describe sums as reserves if they are in reality frozen into permanent capital.

Above all, many companies take account of the greater importance which their employees and the public attach to the rate than to the amount of dividend, although the nominal capital on which that rate is calculated is a more or less arbitrary sum, standing in no fixed connection with asset values. This wrong emphasis is fostered by British company law, which requires every share to have a par value, and by the convention which expresses profit in relation to capital rather than to turnover, or costs, or any other possible measure.

Suppose two companies of equal profitability each start with 400,000 shares of £1 and eventually have net assets of £2,000,000 and distribute an annual dividend of £100,000. The first company after a succession of free bonuses has £1,600,000 nominal capital and £400,000 reserves, while the second has its original capital of £400,000 and reserves of £1,600,000. The first company's dividend will be declared as 6¼ per cent., and the second company's as 25 per cent. Although the amounts involved, both of capital employed and income, are precisely the same, the public is disposed to regard the second company's dividend as the higher. Some businesses, feeling they cannot ignore this tendency however unwarranted it may be, distribute free bonuses in order to avoid criticism of a high nominal rate of dividend, since these bonuses enable larger amounts of dividend to be paid without increasing—or even while reducing—the rate. A liberal bonus policy is, indeed, sometimes criticised because it is held that excessive dilution of the nominal capital keeps the rate of dividend artificially low and conceals the true trend of profits. From the company's own point of view, it may be remarked that where a fairly constant rate of profit is earned on growing assets, it is more logical to adjust from time to time the book value of the proprietors' capital, which really is changing, than the rate of profit, which is not.

Similar over-emphasis on nominal capital is shown by a certain type of investor who judges the dearness of a share by the difference between its market and par values. With a yield on dividend of a little under 7 per cent., the £1 shares of the first company just described would be 18s. and of the second, 72s. The latter price, which is a premium of 52s. over the nominal value, is liable to be regarded quite erroneously as the higher of the two. Also for much sounder reasons some small investors do not like " heavy " shares —shares, that is, costing many pounds apiece. It is difficult to invest moderate amounts of cash in convenient round numbers of such units, or to split the holdings frequently. Hence companies sometimes find it good policy to give in to the prejudice against high-premium shares by increasing nominal capital through a capitalisation of profits. Also there is agreement on all sides that any free bonus which involves a substantial increase in the number of shares and a decrease in their price improves marketability and hence aggregate values. Yet translation into more convenient units could be achieved just as well by splitting the share denomination, and it is doubtful whether a free bonus as distinct from a division of the equity into a greater number of parts has any effect on public favour, other than its tendency to reduce the premium on shares standing far above their par values.

6. The Individual Shareholders

The emphasis on market value and the strict division between capital and income in the points of view already put forward must be rejected in studying the effect of bonus issues upon individuals, and the two types of receipt should be considered together over a period of time. The clue to the problem is that individuals do not pay the same average rate of tax on income as each other or as the company, but capital gains at present are untaxed and affect all individuals equally. Hence the generalisation can be made that other things being equal any given sum retained and then capitalised by a company has a smaller money value in the hands of a person paying less than the company's rate of tax and a higher value to someone paying more than the company's rate, than if the same sum had (after grossing-up) been distributed as dividend.

The argument can be best developed by illustrations, three cases being assumed: (A) where the company declares a free bonus and the rights are sold by the individual members; (B) where the rights are retained; and (C) where the company distributes profits fully, instead of accumulating them in part and then issuing bonus shares.

Suppose a company with 1,000,000 shares of £1 subscribed at par earns from trading £140,000 gross a year, can obtain 6 per cent. gross on retained profits, pays an average tax of 10s. in the £, and remains in being for twelve years. It is then bought up by another business, at £1,200,000 for the original assets and goodwill, plus the book value of subsequent additions to assets. Shareholders fall equally into three groups, paying average tax rates of 5s., 10s. (that is, the same rate as the company) and 15s.

In Case (A) the company pays 4 per cent. gross dividend out of trading profits and withholds £100,000 gross or £50,000 net each year. In turn, each year's net retained trading profits earn 6 per cent. gross or 3 per cent. net. After ten years, £500,000 is capitalised as a 50 per cent. free bonus, members selling their rights. A rate of 4 per cent. is still paid on the increased capital, the dividend being valued in the market at 25 years' purchase. Two years later the liquidating value of the equity is about £1,882,000, being £1,200,000, plus £682,300 representing the accumulation at 3 per cent. net per annum of the additions to assets of £50,000 net a year for the first ten years and £40,000 for the last two.

Case (B) is exactly the same, except that members keep their new shares. In Case (C) the company pays out the entire trading profits as 14 per cent. dividend throughout the twelve years, and can of course make no additions to assets and no bonus issue. The liquidating value is in consequence only the £1,200,000 payable for the original assets and goodwill.

THE COMBINATION OF CAPITAL AND INCOME

£	To members paying average tax of					
Per 1,000 original shares	5s.		10s.		15s.	
Detailed amounts :						
(A) Net dividend in first 10 years on 1,000 shares	300		200		100	
Sale of 500 bonus shares	500		500		500	
Net dividend in next 2 years on 1,000 shares	60		40		20	
Liquidation proceeds on 1,000 shares	1,255		1,255		1,255	
Original subscription	−1,000	1,115	−1,000	995	−1,000	875
(B) Net dividend in first 10 years on 1,000 shares	300		200		100	
Net dividend in next 2 years on 1,500 shares	90		60		30	
Liquidation proceeds on 1,500 shares	1,882		1,882		1,882	
Original subscription	−1,000	1,272	−1,000	1,142	−1,000	1,012
(C) Net dividend in 12 years on 1,000 shares	1,260		840		420	
Liquidation proceeds on 1,000 shares	1,200		1,200		1,200	
Original subscription	−1,000	1,460	−1,000	1,040	−1,000	620
	Cap. profit	Net inc.	Cap. profit	Net inc.	Cap. profit	Net inc.
Total amounts of capital profit and net income :						
Case (A)	755	360	755	240	755	120
Case (B)	882	390	882	260	882	130
Case (C)	200	1,260	200	840	200	420
Proportion (per cent.) to different tax groups in :						
Case (A)	37·4		33·3		29·3	
Case (B)	37·1		33·3		29·6	
Case (C)	46·8		33·3		19·9	

7. The Combination of Capital and Income

The net outcome over the whole period to members subscribing at the beginning for 1,000 shares a head is shown in the accompanying table. And the implications of the table and of our present tax laws concerning capital profits are set out in the following remarks.

(1) As between (A) and (B), members who sell their new shares will in the winding-up get only $1/(1 + r)$ of what they would have got if they had kept the bonus shares. A sale of bonus shares being therefore equivalent to a sale of $r/(1 + r)$ of a member's original holding, any profit arises from this sale rather than from the bonus issue as such. There is no logical connection between the final outcome under (A) and under (B); for any one tax group, either may come to a larger sum than the other, the difference depending on two unrelated facts—the liquidation proceeds per share and the price at which the bonus or else part of the original shares are sold.

Suppose that in (A) the company had issued no bonus but at the tenth year had increased the rate of dividend instead of the nominal capital by one-half, and members had sold one-third of their shares. The latter sale would have brought in £500 at the presumed 25 years' purchase of a 6 per cent. dividend—the same amount as the sale of bonus shares in (A) in the table. On the remaining 666⅔ shares, the net income with a 6 per cent. instead of a 4 per cent. dividend in the next two years would also be the same amount as in the table. The liquidating value would likewise be unaffected, as additions to net assets are reduced, owing to the higher distribution, to £40,000 each year as before. Thus any difference between (A) and (B), while perhaps due to the bonus at first sight, could arise instead from a simultaneous change in the rate of dividend and the sale of enough shares to leave the annual income unaltered.

(2) As between (A) and (C), the individual paying less than the company's rate of tax is, of course, always better off absolutely in money terms than a person paying more than the company's rate. But he is worse off *relatively* to the other tax groups when a company issues bonus shares than if, instead of increasing the nominal capital, it had distributed an equivalent grossed-up sum as dividend. The relative position of a surtax-payer is obviously affected in the opposite direction.

Now we have seen in (1) above that the same sums as in Case (A) could have been arrived at without any bonus, by an increase in the rate of dividend on an unchanged capital. Any difference between (A) and (C) cannot therefore be due to a bonus issue alone. Carrying the comparison a stage further back, the difference is more properly ascribable to the *retention* of profits in (A) as compared with their distribution in (C). For retained profits can either be capitalised, or provide the margin out of which a higher dividend could be paid. A third alternative is that they remain in the business, adding all the time to the underlying asset values and so acting as one of the many influences on market price.

(3) The position of a small taxpayer relative to other classes is not a function of a rate of bonus. It depends also (quite apart from year-to-year variations in tax rates) on the maintenance or otherwise of the old percentage dividend, on the length of the period before and after any bonus and on the number of years' purchase at which dividends are valued. The most that can be said is that any event which

decreases (or increases) the amount of capital in combined amounts of capital profit and net income over a period, improves (or worsens) the position of the small taxpayer relative to other classes but reduces (or increases) the relative advantage to him of a distribution as distinct from a capitalisation of profits.

Suppose in (A) the company doubles the rate of dividend after distributing the share bonus and continues in existence for ten more years, the new shares being valued at only fifteen years' purchase of the increased dividend. The other suppositions are unchanged, except that because of the longer life of the company (with a reduction in retained profits in the second ten years) the liquidation value in (A) works out at about £1,927,000 and dividends in (C) come to the net equivalent of £2,800 gross per 1,000 shares. The ratios between the three tax groups are then 40·1, 33·3 and 26·6 per cent. under (A), and 47·9, 33·3 and 18·8 per cent. under (C). In (A) the bonus shares are sold at fewer years' purchase of an increased percentage dividend, and the liquidation proceeds also are higher. On balance a net rise of £130 in capital profits is more than offset by the much more important increase in income, due partly to the longer life of the company and partly to the higher rate of dividend. In both (A) and (C) the small taxpayer's position relative to the others is better than in the table, but the margin between (A) and (C) has contracted.

(4) The position of a person paying exactly the company's rate of tax is, in the illustrations used, constant throughout, it making no difference whether (A), (B) or (C) happens. Such a situation is very rare in practice, because profits tax is not allowable, like income tax deducted from dividends, as a credit against a recipient's personal tax liability. Thus any sums grossed up at the company's combined rate must normally give an amount greater than the maximum gross income receivable by a person not subject to tax at all. The complication of profits tax has been omitted because it affects individual taxpayers only indirectly : profits tax in general, by reducing the amount of net retained profit and hence of the value of the equity to all classes, worsens the absolute but improves the relative position of the small taxpayer. A similar argument applies to an excess profits tax or any other impost on the company which is not credited to individual shareholders.

(5) Issues on bonus terms do not affect these principles: the consideration for the new shares has merely to be deducted from the gross proceeds, and is the same for all tax groups. The company's earnings from the new money, however, affect its dividend-paying capacity. Such issues which increase the income element tend therefore to operate more to the advantage of the small taxpayer than free bonuses.

(6) If the company were not to wind up, but members were to sell shares in the market, the same principles apply, though there would be differences in practical effect. On the sale of a going concern, past dividend policy has no bearing on the price that would be obtainable. With stock exchange sales, however, dividends tend to carry greater weight than retained profits, and the contrast in the final capital portions of (A) and (C) would in practice be somewhat smaller than in the illustrations given because of the difference in distribution policies.

8. SUMMARY AND CONCLUSIONS

We have seen that the customary calculations of "rights", though essential for understanding the theory of the market behaviour of bonus issues, are of no use in studying their value to members. Such calculations are based on the premiss that a bonus causes neither gain nor loss on the old and new capital combined.

A free bonus may be of some benefit to the company and thus to the proprietors indirectly, from the greater realism of the balance sheet. It normally involves the subdivision of the company's capital into more and cheaper units, which in turn improves marketability. Also some companies think it desirable to give way to the public's prejudice against a high dividend rate, or against a large margin between market and par values. Such indirect influences on aggregate share values are, however, probably of trivial importance.

Illustrations have also been given of the general proposition that because of our present tax laws, any event which decreases the amount of capital in a total of capital gain and net income combined over a period improves the position of a small taxpayer or worsens that of a surtax payer relative to other tax groups. For both large and small taxpayers, such decrease in the proportion of capital to net income also reduces the difference between the effect of capitalising or of distributing profits.

The investment argument is unassailable inasmuch as it insists that the sale of bonus shares is the same as a sale of part of a member's interest in the company's equity. In studying the effect upon different tax groups of combining capital and net income, it has been confirmed in section 7 (1) above that the results of a rate of bonus r accompanied by a maintained rate of dividend are identical with an increase r in the dividend where no bonus is issued and a sale of $r/(1+r)$ of each holding. We have seen, too, that the apparent advantage to a small taxpayer (relative to other classes) of a distribution contrasted with a capitalisation of profits is really due to the contrast with a retention of profits.

The investment argument is less impressive when it says that any rise in aggregate market values from the maintenance of the former rate of dividend on more capital could arise equally well from an increase in the rate of dividend on the old capital. This is to speak in comparative terms only, and to say merely that a bonus is not more valuable than another course of action giving the same result. It does not say that a bonus has no value. A higher rate of dividend on the old capital and a maintained rate on capital as increased by a bonus are not consequences one of the other; they are alternatives. A bonus (provided that the amount of dividend keeps pace with the capital) is one way of adding, although not in direct proportion, to prospective market values; it is also one way of transferring the value of retained profits from the company to individual members and thus worsening the relative position of the small taxpayer.

The validity of the social argument rather depends on how far it concedes that the tendency of a new issue is to depress the value of the old shares. In its barest form, this point of view simply says that bonus shares can often provide a tax-free gain; it is really a criticism of the tax-free character of capital profits in general and not of bonus shares specifically. To develop such criticism would of course be beyond the scope of the present study.

Our final conclusions may be set out thus: when net capital gains and net income are combined over a period, the effect of our present tax laws is that the retention of profits instead of their distribution worsens the position of the small taxpayer and improves the position of the large, relative to the other tax groups. And an increase in the amount of dividend from whatever cause tends to increase the aggregate market capitalisation of a company, although in a lesser degree. A bonus issue, while not, it seems, conferring any advantage *greater* than that available by other means, is one of the principal methods of transferring the value of retained profits from the company to the corporators (and thereby improving the relative position of the surtax payer) and one of the two methods of increasing the amount of dividend and so tending to raise aggregate market capitalisation.

London.

The First London Dock Boom and the Growth of The West India Docks

By Walter M. Stern

In the course of the 18th century, the trade of the Port of London trebled, whether measured by official values of imports and exports or by number and tonnage of ships using the Port.[1] More and ever larger merchantmen entered the Port, but nothing was done to adapt it to the growing trade. As the draught of vessels increased, the shipping channel in the centre of the River which they could safely use became narrower. Once arrived in the Pool, they moored wherever they could find room. While thus immobilised, they blocked the shipping channel for other vessels; navigation up the River and in the Pool of London became ever more perilous as congestion grew worse. Complaints rose to a high pitch at the outbreak of the French wars, when foreign trade, hitherto one of the chief mercantile activities of the country, became a matter of national survival.

Of the various branches of overseas trade using the Port of London, the West India trade was the most important as regards both volume and value of merchandise.[2] Even before the war rendered a convoy system necessary, prevailing winds determined sailings in such a manner that all West India ships reached London between July and October and left again before the end of November. Figures calculated by the Port Committee of the Court of Common Council[3] in 1798 showed the average amount of shipping in the Pool at any one time to be 689 ships of 141 tons (total tonnage 97,149) whereas West India shipping usually in the Pool between July and October was 240 ships of 266 tons (total tonnage 63,840), so that during this period of the year the West India trade accounted for more than one-third of the total number, and two-thirds of the total tonnage, of ships occupying the Pool. Of all its users, West India ships were second in size only to East Indiamen. By concentrating their use of the Port upon four months of the year, they contributed considerably to the prevailing congestion, from which they were prominent sufferers. Overcrowding extended to the warehouse space available for their goods. According to Tatham, writing in 1799,[1] 32,000 hogsheads of sugar could be accommodated in the warehouses attached to the legal quays, whereas the total quantity arriving from the West Indies in any one year averaged 100,000 to 120,000 hogsheads; he recalled instances when a fleet from the Leeward Islands had brought 35,000 hogsheads, another from Jamaica 40,000.

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[1] Official returns reprinted in the Report of the Select Committee of the House of Commons to enquire into the best Mode of providing sufficient Accommodation for the increased Trade and Shipping of the Port of London, dated 13/5/1796; *H.o.C. Printed Reports*, Vol. XIV (1793–1802), pp. 267–443.

[2] Sir Joseph G. Broodbank: *History of the Port of London* (1921), Vol. I, p. 90; Patrick Colquhoun: *A Treatise on the Police of the Metropolis*, (6th ed., 1800), p. 215, estimates its value at only one-sixth of the total trade of the Port; all other estimates put it higher.

[3] The Minute Books of this Committee have unfortunately disappeared and could not be traced, but by courtesy of the City of London Record Office, I have had access to the Court of Common Council Journals, which contain *inter alia* the Port Committee's reports to the full Court. The above is quoted from Journal (Co. Co. Jls.) No. 78, fols. 27–48b.

Lack of space for unloading and warehousing goods had caused complaints in the Port of London for more than a hundred years. The legal quays, licensed by the Customs Authorities for the clearance of imports, had not been extended since 1666[2]; the only relief afforded in the 18th century had been the establishment of a number of sufferance wharves on the south side of the River, endowed with limited privileges by the Customs with regard to the unloading of certain commodities, which were taken there by lighters. Owners of legal quays and sufferance wharfingers allied themselves to other vested interests opposed to the extension of port accommodation in London: lightermen, watermen, carmen and above all the unruly porters' fellowships, all interested in subjecting goods during discharge or loading to a maximum of handling, carrying and delay. The City of London licensed them all, exercised supervision over their work and drew a considerable income from their fees.

Of vested interests in port congestion and delay, these groups represented the lawful section. Equally strong was the concern of a large number of men whose activities dispensed with the sanction of the law. Valuable goods on open quays and lighters formed an irresistible temptation to a whole host of criminals. Patrick Colquhoun, studying methods of pilfering with the expert eye of the police administrator, gave a detailed description of various stratagems.[1] He listed river pirates, night plunderers, light horsemen, heavy horsemen, game watermen, game lightermen, mudlarks, scuffle-hunters, copemen and a number of inferior revenue officers who joined in the game. Each of these pilferers followed his own methods, some working at night and armed, others in day-time with the aid of loose baggy clothing, some prowling in the mud at low tide, waiting for goods to be cast overboard by accomplices, yet others starting fights during unloading and seizing their booty during the general commotion. Lindsay[2] adds to the list a species of ratcatcher who carried live rats into the ship so as to prolong his opportunities for plundering, and John Drinkald, West India shipowner, ex-lighterman and wharfinger, in evidence before a House of Commons' Select Committee[3] in 1823, spoke of coopers and lumpers who received insufficient wages on the understanding that they were permitted to retain for their own use a percentage of the goods handled—a practice leading in due course to plunder. As was stressed by Colquhoun, the West India traders were the worst sufferers from such pilfering: their imports tempted not only by their market value, but also by the attractions of immediate consumption, the bulk consisting of sugar, rum and coffee. It was therefore the Committee of West India Merchants which backed and largely financed Colquhoun's Marine Police Institution in 1798.[4] Six months after the river police had made their debut in the Port, the Committee put on record their appreciation of Colquhoun's exertions.[5]

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[1] W. Tatham: *The Political Economy of Inland Navigation, Irrigation and Drainage* (1799), p. 150.

[2] *Ibid.*, p. 138; Sir David J. Owen: *The Origin and Development of the Ports of the United Kingdom* (1939; 2nd ed. 1948), p. 41.

A number of contemporaries hazarded estimates of the financial loss incurred by the West India trade from such depredations. They ranged from £250,000[6] to £500,000[7] a year; as a proportion of the value of total goods in the Port of London exposed to pilferage, Colquhoun calculated the damage at three-quarters of one per cent.,[6] while George Hibbert, M.P., first chairman of the West India Dock

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[1] Colquhoun: *op. cit.*, pp. 218–238.

[2] W. S. Lindsay: *History of Merchant Shipping and Ancient Commerce* (1874), Vol. II, pp. 415–8.

[3] Printed in *B.P.P.*, 1823, Vol. IV, pp. 489 *et seq.*

[4] Colquhoun: *op. cit.*, p. 239.

[5] *Ibid.*, p. 242 n.

[6] *Ibid.*, p. 215.

[7] George Hibbert in Parliamentary Debates (*Hansard*), Vol. IX, pp. 927–9.

Company, in a survey of the past given to a general meeting of shareholders in 1810, suggested that the loss on indigo, cocoa, wines, logwood and ginger exceeded the hundredth part, on sugar the fiftieth and on rum the fortieth.[1] In view of the value and nature of these vested interests in pilferage, it is not surprising that the West India Dock Company, on first establishing docks for the safe discharge of goods, should have received a large number of threats to its works. No sooner had its first dock been completed than it applied for, and obtained, a military guard, which remained a permanent feature of its establishment.[2]

Wet docks were not a complete novelty in Britain, nor even in the Port of London. The Howland Great Wet Dock, of Rotherhithe (later named Greenland Dock and now part of the Surrey Commercial Docks) had been opened in the 17th century[3] as a private venture by an enterprising individual, and in Glasgow, Liverpool and Hull local authorities had initiated dock development. Not until the end of the 18th century, however, did a commercial company seek incorporation and powers of compulsory land purchase and dock management from Parliament.

Immediately war with France had broken out, the need for improvements in the Port of London became an urgent matter. On the 10th September, 1793, West India merchants in London met and appointed a Committee

> " for the purpose of taking all such measures by
> " conferences with Public Bodies or otherwise, as may
> " best facilitate the discharge of Ships now arrived,
> " and also prevent future inconveniences in the discharge
> " of West India Shipping " ;

by the end of the year, the Committee reported that wharfingers, though charging warehouse rent, often left sugar in the open, because they had no space to accommodate it under cover ; that the same applied to rum and coffee, which were subject to seizure by the Customs, unless landed within 30 days from the report of the ship, and that only a special indulgence issued by the Treasury had saved more than half of the rum and coffee imports during October 1793 from such seizure ; that the convoy system, now the country was at war, aggravated the shortage of space and that the West India trade might have to reconsider its ability to use the Port of London, if nothing were done to extend warehouse room. This last recommendation constituted a shrewd hint to the City, whose disinclination towards reform was notorious, that continued neglect might lead to permanent loss of the West India trade. For the moment, however, the West India Merchants' Committee thought merely along lines of extending legal quay privileges to further premises.[1]

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[1] Quoted by Baron Dupin : *The Commercial Power of Great Britain* (translation 1825), pp. 44–5.

[2] I am indebted to the Port of London Authority for permission to use the Minute Books of the West India Dock Company, which are complete and form an invaluable record. The above is quoted from Book 3, fols. 180–2, 239.

[3] Writers disagree about the date of its establishment. Lindsay, *op. cit.*, Vol. II, p. 409, and Palgrave's *Dictionary of Political Economy* (ed. Henry Higgs, 1925), Vol. I, give it as 1660; Owen, *op. cit.*, p. 40, puts it at " about thirty years after the Fire ".

Much more ambitious schemes were already afoot. A naval architect and trader, William Vaughan, who had abandoned hope of effective action emanating from the City of London, was calling meetings of merchants and others and writing tracts, advocating the establishment of wet docks at St. Katherine's Church, Wapping, the Isle of Dogs and Rotherhithe ; he was the moving spirit behind the early agitation for dock construction.[2] Tatham's treatise[3] similarly demanded docks, quoting precedents at Liverpool and Hull and suggesting that the revenue for their maintenance be derived from a rate on tonnage or from weekly rents,[4] but he was not an original writer and may easily have copied proposals from Vaughan.

As a result of Vaughan's activities, a general meeting of London merchants in March 1794 once more voiced dissatisfaction with the available port accommodation and appointed a committee—on which Vaughan was prominent—to consider remedies. Twelve months later they reported back with a scheme, for which they had already obtained the sanction of Trinity House : wet docks were to be constructed at Wapping at a cost of £800,000 (a sum duly subscribed by the end of 1795), the outlay to be recovered by a tonnage duty on all shipping using the Port, justified by the relief afforded by the removal of a large number of ships from the open River into the docks. The advisability of a canal to connect Blackwall to the new docks was still under consideration.[5] This was the form in which the

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[1] Quoted from Co. Co. Jls. No. 77, fols. 329–343b.
[2] Broodbank : *op. cit.*, Vol. I, pp. 78–9.
[3] Tatham : *op. cit.*
[4] *Ibid.*, p. 183.
[5] *Ibid.*, pp. 204–225.

London Docks plan first attracted public notice. The City of London became officially acquainted with the scheme when petitions began to pour into the Court of Common Council to oppose what was alleged to be a plan promoted by

> " opulent and respectable persons chiefly foreigners in " regard to the freedom of this City ".[1]

At a meeting of London Docks subscribers, held early in 1796 at the London Tavern, it was resolved to apply to Parliament for incorporation and to limit dividends to ten per cent.; a committee were elected on which, apart from William Vaughan, served at least two aldermen of the City of London (Sir John Eamer and George Hibbert).[2] The City, rudely shocked into activity, not only presented a counter-petition to the House of Commons, but also sent a memorial to the Treasury, proclaiming its conversion to the necessity of wet docks in the Port, but denouncing the scheme now pending as being

> " pregnant with the Evils before stated to your Lord-" ships and laying such a heavy and perpetual impost " upon the Trade of the Port as may prove as fatal in " its consequences as it is bold in its design ",

suggesting that many of the promoters had no stake in the Port of London beyond the desire to collect fees from its trade, that the scheme would displace many legitimate interests and require the destruction of nearly 2,000 houses, and hinting that it was bringing forward a plan of its own, which would be cheaper and more conservative.[3] Thus, while it had taken almost a century to produce any scheme for the improvement of the Port of London, at the beginning of 1796 two plans suddenly competed for the favour of the authorities.

Nothing shows more clearly the variety of interests who considered themselves injured by the London Docks project than the number of counter-petitions presented to the House of Commons. Both the owners and the warehousemen of the legal quays petitioned; so did the sufferance wharfingers. The London watermen, lightermen, carmen, ticket porters and tackle house masters came forward with separate petitions. Petitions by the City of London were supported by those from the Cordwainers', Fishmongers' and Vintners' Companies, the Wards of Aldersgate, Billingsgate, Candlewick, Dowgate, Queenshithe, Tower and Vintry, the Boroughs of Hertford and Southwark, St. Mary Magdalen in Bermondsey and St. Mary in Rotherhithe as well as another group of parishes too numerous to set out in full. The Tower Hamlet Sewers, the Shadwell Waterworks and the River Lee Navigation added their prayers that the bill might fail to those of the Hermitage Iron & Brass Foundry and of James Nowlan, soap maker; petitions came from the shippers of Gainsborough and of Thorne, near Hull, and from Balliol and Magdalen Colleges, Oxford. Most of these petitioners objected to the proposed diversion of trade from its customary location and beneficiaries to new ones; a few were themselves domiciled on land threatened with compulsory purchase powers; the two groups of shippers alone were seriously concerned with the proposed tonnage duty. As against the flood of opposition, petitions in favour of the bill were much fewer and came from three distinct interests: traders, as represented by the West India planters, a group of London importers and exporters, a body of merchants trading to North America, shippers using the Port of London as well as those from Aberdeen, Maldon and Scarborough, the East India, Levant and Russia Companies; Port of London pilots; and the London insurers, represented by one petition from their association and another from the Royal Exchange Assurance.[1] After all the opposition which it had excited, the bill never reached its second reading in that session and was re-introduced late in 1796, with its most contentious feature, the canal from Blackwall to Wapping, omitted. The list of counter-petitions received by Parliament was smaller than on the first tabling of the bill, but it was headed again by the City of London.

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[1] Co. Co. Jls., No. 76, fols. 9–9b, 77b–82.

[2] Tatham, *op. cit.*, pp. 204–225.

[3] Co. Co. Jls., No. 76, fols. 125b–131.

This time, however, the City did not only obstruct, but offered a reasoned plea for the rejection of the bill, alleging that it obviated neither the congestion in the Pool, which ships would still have to cross, nor the dangerous circumnavigation of the Isle of Dogs, that it proposed to levy duties on the whole body of Port users for the sole benefit of the West India trade, burdening shipping with a capital charge of £2,000,000 and profits of ten per cent., and that it failed to comply with several requirements insisted upon by the Commissioners of Customs; it tended to

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[1] House of Commons Jls., Vol. LI, pp. 424–579.

> " sacrifice the great Interests of the Commerce of the
> " Port to the convenience or avarice of a few powerful
> " Individuals, and which must put an End to all
> " attempts at any further Improvement, by anticipating
> " and exhausting the only Fund which can encourage
> " and support any great and general Undertaking ".[1]

This strong language signified that the City had matured a counter-plan ready for submission to Parliament. Early in 1796, the Port Committee had viewed a spot in the Isle of Dogs

> " in order to fix on a proper and convenient situation
> " for wet docks "[2]

and had lost no time in seeking an interview with the Chancellor of the Exchequer in order to obtain Government backing for their scheme. Pitt gave an exceedingly diplomatic answer. He stressed the need for increased accommodation and

> " thought that if the Corporation could afford the relief
> " solicited, they had a fair claim to a preference in
> " the execution and superintendance of the Plans ".

Instead of committing the Government to stopping any rival scheme, he merely mentioned his desire for a parliamentary decision within the current session.[3]

The West India Docks bill excited far less opposition in Parliament than the London Docks bill. Fewer interests were affected in an area which had hitherto had no commercial use at all and was hardly known to most Londoners. The Isle of Dogs in the 18th century consisted of bog, intersected by dykes, used only for pasturing cattle; many parts were covered with reeds and inundated during the wet season. There were two inhabitants: one drove the cattle off the marshes, the other worked Potter's Ferry across to Greenwich.[4] (Nor did the Isle of Dogs lose its rustic nature at all quickly. Several " pieces or parcels of meadow and marshland " were purchased there in 1801 on behalf of the West India Dock Company,[1] and as late as 1829 a cattle-owner offered the Company £2 per week for permission to pasture his stock on the Company's grassland south of the City Canal.[2]) It is therefore not surprising that the City expected its bill to have an easier passage than that of the London Docks promoters. In the 1796 session, it never achieved a second reading, but the only petitions against it which Parliament received in the following session came from the London watermen and the Tower Hamlet Sewers (both of whom petitioned against both dock bills indiscriminately), the Cordwainers' Company and Brazenose College.[3] A few additional petitions did not reach Parliament, but the Court of Common Council, which referred them to its Port Committee.[4]

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[1] Co. Co. Jls., No. 77, fols. 86b–90b.

[2] *Loc. cit.*, No. 76, fols. 103b–104.

[3] *Ibid.*, fols. 112b–114b.

[4] Newton and Others v. Cubitt and Others, Court of Common Pleas, Engl. Law Reports, Vol. 142, pp. 1053–1066. I owe this reference to Dr. A. E. J. Hollaender, of the Guildhall Library.

From now onwards, the history of the London and the West India Docks schemes becomes the story of two rival sets of promoters, each trying to beat the other to the winning-post, which in this race was represented by the Statute Book. The contest was not decided till 1799. Meanwhile, so discouraging were the Customs Commissioners, when consulted about the West India Docks scheme, that the City late in 1797 almost withdrew from the fight. At this stage, the West India planters and merchants intervened and proposed to the City joint action to implement the plan for a canal across, and two wet docks in, the Isle of Dogs, to be allocated to the West India trade. Planters and and merchants were to raise the funds for the construction of the docks ; in order to defray the cost of the canal, they suggested a tonnage duty on all shipping frequenting the Port.[5] This proposal represented a change of front on the part of the West India trade. A majority had hitherto backed the London Docks bill, looking upon the Isle of Dogs plan as little better than a diversionary manœuvre on the part of the City. Having witnessed the opposition aroused by the London Docks bill and the strength of the interests clamouring for compensation, they were now attracted by the less expensive and contentious scheme. There was also a technical reason for preferring the Isle of Dogs site. West

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[1] Co. Co. Jls., No. 79, fols. 288–289.
[2] West India Dock Co. Minute Book 45, fols. 495–497.
[3] House of Commons Jls., Vol. LII, pp. 322, 429, 437.
[4] Co. Co. Jls., No. 77, fols. 74b–76.
[5] *Ibid.*, fols. 218–219b.

India ships were among vessels of great draught which found River navigation too hazardous. No more than one third of the West India ships would risk coming up the River as high as was necessary to enter the proposed London Docks. Accommodation at the eastern end of the Isle of Dogs would obviate a large part of the dangerous route. If the merchants provided solid backing for docks in the Isle of Dogs, they might succeed in having these docks reserved exclusively for the West India trade.[1]

Support from the merchants encouraged the City to brave the disapproval of the Customs Commissioners, who —in a report[2] phrased as though it had issued from the Circumlocution Office—condemned the plan with faint praise for a few isolated features. In their view, the docks afforded insufficient relief to the Port as a whole, while being too remote from Customs House ; the Commissioners did not welcome a separate customs establishment in the Isle of Dogs. The proposed quay, one square mile in size, was too large for effective customs supervision, and the Commissioners disliked the idea of handling imports and exports within the walls of the same dock. The promoters took up these objections and met them as far as possible. They guaranteed arrangements by which imported goods would have no opportunity of contact with those destined for export, but pointed out that the Commissioners' demands for generous space for the separation of different categories of goods conflicted with their desire for proximity to Customs House ; in a completely built-up district, the requisite area could not be cleared without excessive opposition and expense. They quoted figures[3] to show the substantial relief given to the Port by the removal from the open River of the West India trade. Having refuted to the best of their abilities the objections to their scheme, the promoters held several further conferences with Pitt. Apparently, they won him over ; the backers of the London Docks bill, aware of the strong support secured by their competitors, suggested that the Chancellor of the Exchequer should decide which of the two bills was to be proceeded with. Pitt was not prepared to emulate Solomon's judgment, unless the City Corporation concurred in the reference of the case to him, and the City, after some heart-burning, agreed, while reserving the right to continue opposition to any plan which interfered with its own privileges and interests.[1] Pitt made it a condition that the West India Docks scheme, even if adopted, was not to preclude proposals for further docks, and watched the progress of both schemes through Parliament in the session of 1798/99.

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[1] These considerations are set out in a report by a Committee of West India Planters and Merchants to their full meeting, dated 16/11/1797, reproduced in Co. Co. Jls., No. 77, fols. 329–343b.

[2] House of Commons Jls., Vol. LIV, pp. 570–587.

[3] Quoted *supra*, pp. 59–60.

This time, a new type of opposition to the West India Docks bill made itself heard, that of merchants who approved of the scheme, but not of the rule compelling all West India ships to use the docks. A resolution condemning this clause had already previously been moved, but negatived in the Court of Common Council[2]; now opposition was carried into Parliament in the form of a counter-petition,[3] and during 1799 several meetings were convened by public advertisement at the London Tavern, when resolutions against this clause were passed and further petitions addressed to the House of Commons.[4] The promoters of the bill remained adamant; they had no hope of making the docks a financial success unless the whole trade were compelled to use them. The clause was to furnish strong reasons for attack against the West India Dock Company 21 years later, when its charter fell due for renewal.

The City Corporation did not consider itself under any obligation to cease its opposition to the London Docks bill. As was its habit, it filed two counter-petitions, one against the principle of the scheme, the other against particular features.[5] It was anxious, urged on by the body of tackle house and ticket porters, to maintain its monopoly of the appointment and licensing of porters anywhere in the Port of London. The House of Commons' Select Committee steadfastly refused to entertain such an assertion of privilege; when a motion in the Court of Common Council once again attempted to enjoin insistence, it was lost for lack of a quorum. The promoters of the London Docks were willing to appease the City by conceding its privilege in this respect, but to such an understanding, the City would not agree.[6]

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[1] All this, including the various reports, is reproduced in the Court of Common Council minutes; Co. Co. Jls., No. 78, fols. 27–48b.

[2] *Loc. cit.*, No. 77, fol. 343b.

[3] House of Commons Jls., Vol. LIV, p. 260.

[4] *Ibid.*, pp. 687, 705.

[5] *Ibid.*, pp. 75–6, 171–2.

[6] Co. Co. Jls., No. 78, fols. 279–280, 293b–296; No. 79, fols. 150–153b.

The House of Commons did not this time entrust the two bills to separate committees, but to a single Select Committee for joint consideration; Pitt delegated to Parliament his authority to decide between the two schemes. The Committee went beyond all previous efforts to ascertain the views of the Revenue. They called for reports from those officers who would be affected by the schemes: the collectors and comptrollers, landing surveyors, landing waiters, woodfarm officers, river inspectors and the surveyor for sloops and boats. No clear conclusion emerges from the views of all these officials. So far as it is possible to judge, the lower ranks in the revenue service favoured the Isle of Dogs scheme; the higher ranks were either non-committal or preferred the new docks to be at Wapping. Solomon's judgment was eventually pronounced by the Committee. The London Docks plan afforded the greatest convenience to small vessels, which formed the greater part of all shipping, because Wapping was nearest to the centre of trade; the West India Docks were peculiarly adapted to the needs of larger ships, because of the proximity of the Isle of Dogs to the sea. Both schemes therefore had unquestionable merits and ought to be carried out; but as all evidence had tended to confirm that the West India Docks could be built more quickly and cheaply than the London Docks, they should have precedence—an opinion corroborated by the Elder Brethren of Trinity House.[1] Parliament accepted the views of the Select Committee, and in accordance with the agreements previously made, gave precedence to the West India Docks bill, which reached the Statute Book in that session.[2]

The years from 1799 to 1815, notwithstanding the French wars, constituted the first great London dock boom. The West India Docks Act furnished a precedent; promoters not only saw opportunities for profitable investment, but also anticipated parliamentary sanction of their schemes. In addition to the docks already mentioned, the East India, Commercial and East Country Docks had been constructed or at least commenced by the time peace was restored; a number of further projects had been submitted to Parliament without however reaching the Statute Book. Capital investment authorised by Parliament in these years for dock building in the Port of London amounted to:

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[1] Co. Co. Jls., No. 78, fols. 293b–296; House of Commons Jls., Vol. LIV, pp. 570–587.

[2] 39 Geo. III, cap. LXIX.

London Docks	£3,250,000
West India Docks ..	1,200,000
East India Docks ..	500,000
Commercial Docks ..	390,000
East Country Docks ..	60,000
Total Dock Investment	£5,400,000

These amounts record historical cost. At least in the case of the West India Docks, the market value of the stock rose to almost double its nominal amount.[1] None of the other docks were equally prosperous, but some capital appreciation took place. The impressive total had been raised entirely by private investors; the West India Dock Company alone had received a loan (for the building of an additional wall to increase the security of the Revenue) of £30,000 from the Consolidated Fund, which was not repaid till 1817.

Parliament carried the London Docks bill in 1800.[2] The City of London did not cease its opposition, even after its own scheme had been adopted; on the contrary,

> " having yielded to the general opinion on the necessity
> " of improving the Port of London ",

it now felt virtuous and demanded that the outcome of its own plans be awaited before promoting " unnecessary and destructive measures ".[3] This dog-in-the-manger attitude did not commend itself to the House of Commons. After a division there, permission to oppose the bill at the Committee stage by counsel and witnesses was refused to the City. Nor was a deputation from the City's Port Committee to Lord Hawkesbury,[4] Chairman of the House of Commons' Select Committee for the Improvement of the Port of London, more successful. Lord Hawkesbury reiterated his Committee's view that both dock schemes were desirable. To City representations regarding the heavy compensation payable to interests affected at Wapping, he replied that this should be entrusted to commissioners already appointed to manage the compensation scheme for the Isle of Dogs project. The City sensed that the atmosphere in the House of Commons was unsympathetic to its ambitions; as a small concession, it obtained the appointment of the Lord Mayor to the board of the London Dock Company.[1] It made one more desultory attempt to oppose the bill in the House of Lords, preparing two petitions, but at least one was never presented; the City had lost heart and did not prosecute its case vigorously.[2] Ten years later, when the London Dock Company augmented its capital, the old feud was revived: once again, the City petitioned Parliament to prevent its former rival from increasing in size.[3] It had no better success than before; Parliament was even less inclined to countenance monopoly claims, and the London Dock Company obtained its Act.[4] For better or worse, rivalry between the two dock companies was to continue.

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[1] Evidence by Henry Longlands, the Company's secretary, to House of Commons' Select Committee, B.P.P., 1823, Vol. IV, pp. 489 *et seq.*

[2] 39 & 40 Geo. III, cap. XLVII.

[3] Petition to House of Commons: Co. Co. Jls., No. 79, fols. 64–65b.

[4] Subsequently the first Earl of Liverpool.

Meanwhile, the West India Docks had made a vigorous start. Less than a month after the passing of its Act, the court of the West India Dock Company held its first meeting; thereafter, meetings twice a week became the rule. A long-drawn-out conflict between the Company and the City Corporation arose from the provision[5] in the Act that all land required for the docks was to be purchased by the City and conveyed to trustees for the Company; after giving rise to an action in Chancery and two arbitration proceedings, the land was eventually conveyed to the Dock Company in 1804, four years after the completion of purchases. However, dock construction had not been held up. The Company was able to open the large import dock to traffic in August 1802, three years after the passing of the Act, as the promoters had promised at the time. As a result, the Government could now license bonded warehouses in the Port of London—a system which Walpole had in vain hoped to introduce 70 years earlier. When the Revenue Authorities had declared themselves satisfied with the safety precautions adopted by the West India Dock Company, the Warehousing Act[6] of 1803 was passed, which in section 1 designated the warehouses of the West India Dock Company by name, though subsequent sections extended the privilege to the London Dock Company and prepared the way for further extensions, subject to safeguards acceptable to the Revenue. The West India Export Dock was completed during 1806. This ended the Company's major constructional projects, though hardly a year passed without the establishment or enlargement of warehouses or other minor improvements. To judge merely by numbers of ships inwards, the Company's business reached its peak by 1810:

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[1] Co. Co. Jls., No. 79, fols. 150–153b.
[2] *Ibid.*, fols. 157–160.
[3] *Loc. cit.*, No. 85, fol. 404; No. 86, fols. 5–6b.
[4] 50 Geo. III, cap. CLI.
[5] Section 74.
[6] 43 Geo. III, cap. 132.

Ships discharged in the West India Docks[1]

1803	374	1807	537	1811	582	1815	481	1819	511
1804	379	1808	598	1812	486	1816	453	1820	544
1805	415	1809	483	1813	465	1817	487	1821	550
1806	496	1810	641	1814	498	1818	512		

These figures are, however, shaped not only by the development of the Company, but also by political events; the strong upward trend between 1806 and 1810 reflects chiefly the Berlin and Milan decrees and the Orders-in-Council. If we disregard short-term disturbances, we see a gradual and fairly regular increase of business up to the end of the war; after that, there was a recession before the upward trend reasserted itself.

Over the course of years, discussion arose now and again whether the West India Dock Company reduced charges to the utmost of its capacity. Some merchants asserted that, had the Company made service to the trade its exclusive concern, it could have reduced their costs far more than it had in fact done. Nobody denied that the Company had enabled the trade to effect considerable economies in transport and handling charges. Speaking to the shareholders in 1810, George Hibbert estimated the saving in money (he put no cash value on time saved), compared to the days of the legal quays, at 18 per cent. for unloading and warehousing.[2] In 1817, the Company reduced its rates, and Henry Longlands, its secretary, speaking in 1823 to the Select Committee of the House of Commons to enquire into the advisability of renewing the Company's monopoly, suggested that the total saving in rates amounted to 32½–47½ per cent. upon shipping and from 10 to 60 per cent. upon goods, of which he instanced sugar as being subject to a 22½ per cent. reduction.[1] John Tilstone, Principal Surveyor of Customs, before the same Committee[1] expressed the saving in the form of average unloading expenses per ton of cargo which were

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[1] Evidence before the Select Committee of the House of Commons, B.P.P., 1823, Vol. IV, pp. 489 *et seq.*

[2] Quoted by Dupin, *op. cit.*, pp. 44–5.

in the open River, 1798–1801	7s. 10½d.
in the West India Docks before 1817 ..	6s. 8d.
in the West India Docks after rate reduction	5s. 0d.

Broodbank[2] lists the reductions up to 1823 under the headings of

	Rates (*per cent.*)	*Rent* (*per cent.*)
Sugar ..	22	20
Coffee and Cocoa	10	16⅔
Rum	10	57
Dry Wood ..	20	33⅓

Testimony to the saving effected by the Company in unloading time was given to the same Committee by the Inspector General of Imports in the London Excise Office, who estimated that a West India ship before 1801 required an average of 25 days to discharge in the River and that the Dock Company by 1818 had cut this time to 15 days. This of course applied to normal conditions. At the height of the mutual blockade between this country and France, so great was the accumulation of coffee at the West India Docks that much of the merchandise suffered spoilage either during unloading or in warehousing.[3] That however was due to economic warfare, not to the Company's shortcomings.

The rivalry between the London Dock Company and the West India Dock Company could be discussed in terms of different political philosophies: from this angle, the London Dock Company represents democracy, the West India Dock Company benevolent autocracy. Conduct of business at the London Docks was easy-going (the Company's opponents called it slovenly); customers and their servants were admitted into the dock; merchants, in discharging cargoes, could employ the ships' crews, their own lumpers or the Company's facilities, as they chose; unlimited samples could be drawn. The West India Dock Company on the other hand stressed the necessity of being master in its own house. As early as 1798, while the project was still in the planning stage, the promoters had laid down a code of rules for the regulation of business, which was subsequently amended in details, but not modified in essentials.[1] When a ship had entered the import dock and complied with reception formalities, the crew had to leave, except for one responsible officer. They were not allowed to discharge the ship, nor could the shipper hire his own lumpers; only men in the Company's employ were permitted to unload, under the direction of one of the Company's foremen. Above all, the Company was adamant in its refusal to admit any of the City of London's tackle house and ticket porters[2]; it wisely decided that it would rather pay compensation to these men than use their services. Once cargo had been discharged, the Company's coopers repaired any damage to packaging which had occurred; the goods were transferred to the Company's warehouse and samples drawn for the use of the owner. If an owner wanted second samples, he had to apply to the Company; if he could establish a good reason for his request, the Company would grant it. If the owner wanted to inspect his goods, he again had to obtain the Company's permission and would then be admitted to the relevant warehouse, accompanied by one of the Company's officers. The Company did not permit persons, who were not either in its service or revenue officers, to be at large on its premises without supervision. The Company attended to requests and complaints promptly and courteously, but very firmly; it gave a hearing to all views, but did not very often change its policy as a result. Its court—consisting of active West India merchants, none of whom devoted more than part of his time to the Company's affairs—continued to meet twice weekly and dealt with all complaints and requests; outsiders were prohibited from addressing communications to the Company's officers direct. Between court meetings, the chairs or a special small committee would deal with matters requiring personal inspection of premises and goods or interviews with the Company's officers. The Company's autocratic manner was deemed necessary and beneficial by the group of West India merchants from whom the court of directors was mainly recruited; it also earned the approval of a majority of revenue officers. It aroused however a great deal of resentment among traders who spoke of monopoly power, oppression and impediments to trade[1] and contrasted this mode of business unfavourably with that of the London Dock Company, maintaining that losses were no greater under the free and easy system prevailing there than under the strict regime of the West India Docks.

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[1] B.P.P., 1823, Vol. IV, pp. 489 *et seq.*

[2] *Op. cit.*, Vol. I, pp. 141–152.

[3] Evidence given to the House of Commons' Select Committee by William Mitchell, Chairman of the West India Dock Co., B.P.P., 1823, Vol. IV, pp. 489 *et seq.*

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[1] Co. Co. Jls., No. 78, fols. 27–48b.
[2] *Loc. cit.*, No. 81, fols. 3b–6; No. 82, fols. 31b–33.

There were two besetting vices against which all dock administration waged a never ending struggle: pilferage and drunkenness. Depredations from the former had been reduced to insignificant proportions, compared to the conditions of which Patrick Colquhoun had written.[2] To anybody who peruses the minute books of the West India Dock Company it must however be apparent that petty pilferage never completely stopped; while crooks were unable, owing to the system of supervision adopted, to make large hauls, small quantities of merchandise continued to be abstracted. Nothing worried the directors of the Company more than this persistence of dishonesty. Every complaint was painstakingly investigated, a disproportionate amount of managerial time spent on discovering petty theft, and hardly a week passed without the summary dismissal of at least one dock labourer who had been caught red-handed with some sugar, coffee, rum or even a piece of mahogany wood. Over revenue officers similarly apprehended, the Company had no disciplinary powers; their names could merely be notified to their superiors. Drunkenness on duty was an equally persistent complaint. It was not usually visited with instant dismissal, unless there were aggravating circumstances, as shown in the resentful resolution passed by the court on the morrow of a visit of inspection by the Chancellor of the Exchequer in 1804,

> "That the Person who attended Mr. Pitt and the
> "Chairman yesterday round the Dock as Constable,
> "being intoxicated upon such an important duty be
> "discharged".[3]

However, the prevention of drunkenness as well as petty pilferage among its staff was a task which baffled even the ingenuity of the West India Dock Company ; it must have been a great deal more difficult for more easy-going establishments.

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[1] E.g., Mr. W. Smith, speaking on behalf of 60 West India produce traders in a parliamentary debate in 1807; Parliamentary Debates (*Hansard*), Vol. IX, pp. 927–9.

[2] Cf. *supra*, pp. 60–61.

[3] West India Dock Co. Minute Book K, fol. 143.

The West India Dock Company was a prosperous undertaking ; its dividends remained consistently higher than those of its competitors during the period up to 1829. Until the opening of the first dock, distribution was at the rate of five per cent. per annum, then for six months seven-and-a-half per cent. ; from 1803 to 1829, the Company unfailingly paid the maximum dividend permitted by its Act, i.e., ten per cent. In 1829 for the first time, it reduced its dividend to eight per cent. The Company must have been one of the first undertakings to pursue a practice not unusual to-day among prosperous firms : up to 1810, it distributed dividends free of income-tax, so that in effect shareholders received 11 per cent. After a stormy debate[1] in 1810, the House of Commons declared this to be in excess of the maximum dividend authorised,[2] and the Company thenceforward abandoned the practice. It is possible that Parliament would have taken a more lenient view, but for the representations made by West India merchants and planters, who wanted the profits applied to reduction of the Company's rates and charges rather than tax relief for shareholders. In view of the Company's prosperity, it is not surprising that Professor N. J. Silberling (when requiring a measuring-rod equivalent to a first-class seasoned public utility bond of modern times to show the normal yield of sound industrial investment in his discussion of " British Financial Experience, 1790–1830 "[3]) should have cast West India Dock stock for this rôle during the period 1806–1828 and based his argument on tables calculated from market prices and yields of this stock.

The London School of Economics.

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[1] Parliamentary Debates (*Hansard*), Vol. XVI, pp. 913–5.

[2] House of Commons Jls., Vol. LXV, p. 344.

[3] *Rev. Econ. Stats.*, 1919, pp. 282 *et seq.* I owe this reference to Mr. L. S. Pressnell.

Book Reviews

Mill on Bentham and Coleridge : with an Introduction by F. R. Leavis. Chatto and Windus. 1950. 168 pp. 7s. 6d.

Essays on Some Unsettled Questions of Political Economy. By J. S. Mill. Series of Reprints of Scarce Works in Political Economy. No. 7. London School of Economics. (1844) 1948. vi + 164 pp. 10s. 6d.

Gladstone is said to have referred to J. S. Mill as " the Saint of Rationalism ". Thanks to Professor Hayek, we have recently become aware of some more human and perhaps less saintly aspects of Mill's complex and, in parts, elusive personality. But for the defence of the intellectual saintliness which Gladstone ascribed to him, there can hardly be any better documents in Mill's writings than the essays on Bentham and Coleridge which he wrote in 1838-39 at a time when he had thrown off, as far as he ever did, the dogmatic rigidities of his father, but was not yet much permeated by the strenuous and slightly paranoiac influences of his gifted wife. The constituent elements of this intellectual saintliness—(of which ' Rationalism ' hardly seems today to be a suitable description)—are pointed out very clearly in F. R. Leavis's Introduction. Located in the region where intellectual and moral qualities meet, it consisted in a tolerance of, and a capacity for immense efforts at understanding, doctrines and arguments diametrically opposed to those of his intellectual inheritance and youthful milieu. Along with this went a keenness of perception for any element of the truth wherever it lurked, the capacity to reconcile and contain superficially or potentially opposing elements in his own system of thought, and, above all, the rejection of the slogans and over-simplifications of politico-intellectual gang-warfare. As Dr. Leavis puts it, Mill possessed " a true and wholly admirable humility that is at the same time a tenacity in working along his own arduous path . . . He spent his life in a strenuous endeavour, pursued with magnificent integrity, to justify his contention that ' the Benthams and the Coleridges, these two sorts of men, who seemed to be, and believe themselves to be, enemies, are in reality allies ' : the side from which he inevitably worked having been determined by his upbringing, he worked indefatigably to correct and complete Utilitarianism by incorporating into it the measure of truth attained by the other side." Or in a single sentence from Mill's Autobiography : " I did not seek and cultivate Carlyle less on account of the fundamental differences in our philosophy ".

The significance of these two essays does not, however, lie only in the view they afford of the noblest aspect of Mill's intellectual personality. They also give an account by a great representative mind of two other great representative minds, " the two great seminal minds of England in their age ". They are, therefore, essential reading for the student of almost any branch of 19th century thought. Dr. Leavis has extracted the essays from the inaccessible volumes of " Dissertations and Discussions " with the ambition of making them " current classics for the literary student ". They may be of interest also to students of Political Economy. For a debate which runs closely parellel to that between " the Benthams and the Coleridges " has been a perennial one, now in the foreground now in the background, in the history of Political Economy, and Mill's effort at understanding both sides might be taken as a model, even if it cannot be regarded as entirely successful.

Mill wrote of Coleridge words which one would like to be able to apply to himself: " Both the theory and practice of enlightened tolerance in matters of opinion, might be exhibited in extracts from his writings more copiously than in those of any other writer we know, though there are a few (and but a few) exceptions to his own practice of it ".

But there is another side of the picture. Very unfortunately, the " exceptions " in Mill's writings are not unimportant and one, where he argued at a considerably less than saintly level of tolerance and perceptiveness, occurred at a key point in his system of economic theory which is touched upon in one of the 'Essays on some Unsettled Questions', written at the age of 23–4. Two of these essays are very distinguished, and even classical contributions, to their subjects (those on the Laws of Interchange between Nations and on the Definition and Method of Political Economy), but perhaps it is that 'On the Influence of Consumption upon Production' which has in recent years had the widest interest, and it is this which we take to illustrate another—and quite contrasting—facet of Mill's intellectual character.

Mill opens his essay with a barrage of 'revolutionary' claims on behalf of what Thomas Chalmers aptly called " the modern paradox " of the " new economists "—(i.e., James Mill, Say, and Ricardo)—that " general over-production is impossible ". The 23-year old Mill dutifully castigates the " pernicious mistakes ", so " flagrantly absurd ", than which " there is nothing which impresses a person of reflection with a stronger sense of the shallowness of the political reasonings of the last two centuries ", i.e., the reasonings of such as Petty, Mandeville, Berkeley, Boisguillebert, Cantillon, Steuart, Quesnay, and others, who would certainly have had no use for James Mill's dogmatic catch-phrase about " the impossibility of general over-production ", *or* for the really rather trivial terminological rigmarole by which it was supported, and the drastic practical conclusions drawn from it. J. S. Mill explains, however: " In opposition to these palpable absurdities, it was triumphantly established by political economists, that consumption never needs encouragement. All which is produced is already consumed, either for the purpose of reproduction or of enjoyment. The person who saves his income is no less a consumer than he who spends it. He consumes it in a different way ".

With all the ambivalence which is so remarkable a feature of the treatment of most of the great issues in the *Principles*, Mill then goes on to present in his essay an excellently precise and penetrating analysis of " over-production ", which can only leave the modern reader at a loss to understand what conceivable significance Mill considered to remain in the catch-phrase about its " impossibility ", and in the great intellectual revolution which the proof of this impossibility apparently ushered in. (J. B. Say had compared his new doctrine with the discoveries of Copernicus and Galileo.) In this essay, there stands out as black beside white the contrast between Mill's mechanical rehearsal of his father's rigidities and terminological dogmatisms, and his own understanding and penetrating analytical insights—which unfortunately he was never to employ much further in economic theory.

The form of Mill's discussion shows close parallels with that " modern paradox " of the " new economists " (20th century style) who recently proved the " impossibility " of divergences between savings and investment by a somewhat similar process and with an approximately similar amount of significance and justification. All this may be found excusable in the 23-year old Mill. But the youthful indiscretions—if Mill ever was youthful—instead of dissolving before a maturer approach, hardened into " orthodox " middle-aged dogmatisms. The treatment in the *Principles* nearly 20 years later, where Mill explicitly hails the intellectual achievements of his father and J. B. Say, was even more dogmatic than in the essay, and there are various passages denouncing the views of Malthus, Chalmers, and Sismondi, and the 18th-century economists generally, in the most extraordinary terms, (notably at the end of Book III, Ch. 14, Section 4). On the other hand, the *Principles* is even more ambivalent than the essay, because elsewhere the argument in the chapter " Of the Tendency of Profits to a Minimum " is held to " alter materially " many of the practical conclusions " long admitted as true by the highest authorities on the subject "—(i.e., apparently Adam Smith and possibly James Mill). In this chapter Mill gives a refutation for ' mature ' economies—including, apparently, Britain in 1848—of what came to be known eventually as " the Treasury view " regarding a sort of fixed capital fund which made any government investment a mere transfer from private investment (*Principles*, Book 4, Ch. 5, Section 1).

What a pity that Mill did not make a serious effort to think out the subject afresh, as he had with his utilitarianism, and that after examining the central principles of his father and Ricardo, with the same detached penetration that he applied in his essay on Bentham, he did not try to repeat the effort of sympathetic understanding in respect of the

18th-century ideas of Malthus, Chalmers and others, in the manner of his essay on Coleridge. How immensely subsequent political economy would have gained from his constructive mediation between the greater realism of the one side and the (possibly) superior logic of the other. Instead, Mill confused a central part of his economic theory by repeating uncritically the intolerant formulæ of his rather lamentable father, and provided his orthodox followers with perfect opportunities to use his authority in support of the dogmatisms which suited them, while neglecting the valuable but quite unreconciled analysis in other parts of his work. For example, Fawcett, Marshall's predecessor at Cambridge, in his text book constructed out of Mill's *Principles* with the aid of Leslie Stephen, began his chapter on Over-production in very similar terms to those of Mill's youthful essay 40 years' before, by convicting "*all economists who preceded James Mill and Ricardo*", and more specifically Chalmers, Malthus and Sismondi, of "most mischievous economic fallacies", and by attributing to them the view that there is a serious danger of over-production in a 'real' *absolute* sense: that is, that more may be produced than people want at *any* price. This is surely an audacious misunderstanding which it would be very difficult to parallel in the writings of the "new economics" of the 20th century—perhaps some slight consolation to one contemplating the more dismal respects in which intellectual history so nearly repeats itself.

T. W. HUTCHISON.

Competition Among the Few. By WILLIAM J. FELLNER. Alfred A. Knopf, New York. 1949. ix + 328 + iii pp. $5.

Classical oligopoly theory was concerned primarily with those situations in which each duopolist tried to maximise his own individual profits, i.e., behaved competitively. Professor Fellner aims at re-orientating the analysis of problems involving small numbers of sellers, by postulating monopolistic behaviour, i.e., the pursuit of the maximum monopoly profit. Competitive action is only, if at all, relevant as a special case which arises when the corporate spirit of producers disintegrates, and it is then merely the prelude to another attempt to achieve the monopoly situation.

Where we have undifferentiated oligopoly, the monopoly price and output can always be calculated. The shape and position of the oligopolists' cost functions will determine how much of the monopoly output each must produce. Implicit in this distribution of the joint profit-maximising output will be a distribution of the sales and of the profits. It might very well be, however, that this profit distribution is not one that is acceptable to the colluding oligopolists, for it might not give to each the share of the monopoly profit to which he believes his relative strength entitles him. If this is so, then the monopoly profit can only be maximised if each firm's profit is divorced from its own output. Such a divorce is achieved by a Pooling Agreement, Similarly, if the oligopolists' products are differentiated, there may be a conflict between the pattern of price, product-quality and advertising expenditure dictated to each oligopolist by the common objective, and that which his assessment of his relative strength leads him to demand. Here again, Professor Fellner argues, the conflict can only be resolved, without the sacrifice of the monopoly profit, by severing the nexus between own output and own earnings : i.e., by a Pooling Agreement.

The Pooling Agreement might not, however, be attractive to the participants, because if such an agreement should collapse, the less efficient firms will find themselves at a disadvantage *vis-à-vis* their more efficient competitors, since during the currency of the agreement their contacts with the market will have been restricted. If this defect is overcome by making the agreement more inclusive and extending its currency, a further disadvantage emerges, for this would imply that the participating firms are willing to abandon unforeseen profit-making opportunities.

If the Pooling Agreement should prove to be unacceptable to the oligopolists, then the objective of maximum monopoly profit is sacrificed. Professor Fellner suggests two alternative policies—market-sharing and profit-sharing. The oligopolists may agree, implicitly or explicitly, to share the market or the profits at each price, in certain proportions. The market- or profit-share accruing to any producer will depend on his strength relative to that of his competitors.

The possibility of any of the above types of agreement obtaining, depends on agreement being reached on present relative strengths. In a dynamic context, however, relative strengths are likely to change through time, due, e.g., to inventiveness, which influences the sales policy or the production function of the innovator. If there is perfect foresight, these changes can be discounted to a present value, on the basis of which an agreement to pursue the monopoly profit can be constructed. If there is uncertainty, such discounting is impossible, and the various manifestations of inventiveness will be excluded from such agreement as is reached. Further, the competitive handling of such excluded variables may destroy the whole spirit of co-operation. For, a price or quality change by one producer which *he* feels to be conducive to the maximisation of the monopoly profit may not be so interpreted by his rivals. They may assume that it is aggressive and retaliate, and cut-throat competition may be the result. In such a situation, stability re-emerges only when there is a new, mutual appreciation of relative strength.

In the light of this description of Professor Fellner's analysis, it is evident that the oligopoly problem is only determinate if relative strength is defined. He gives the following four determinants[1] :

(i) The long-run consequences of violating accepted value judgments.

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[1] Pp. 24–33.

(ii) The immediate political consequences of a stalemate in the relations between the parties concerned.

(iii) The ability of the parties to take and to inflict losses during stalemates.

(iv) Toughness in the sense of unwillingness to yield in a range in which the other party is expected to yield if one fails to do so.

It is immediately obvious that (i) and (ii) are not determinants of relative strength: rather they are curbs placed by social institutions, attitudes or the *mores* on the uses to which economic power can be put. The third factor recognises one element of strength, but in his elaboration of it Professor Fellner does little more than restate the problem. His fourth factor may or may not be a component of a firm's strength relative to that of its competitors, according as the "toughness" more than reflects, or merely reflects, the objective facts in the given situation. Pending further empirical study of the determinants of economic power, it is difficult to offer more constructive criticism of Professor Fellner's suggestions. It is likely, however, that for the individual firm, brute size, the nature of its liabilities and assets structures, the shape of its cost function, the personality of its controller and the character of its development and of the history of its industry will all affect its power to influence its fellows.

The theory of limited Joint Maximisation forms the core of the book. There is also, however, a good exposition of the oligopoly theories of Cournot, Bertrand and Stackelberg,[1] (with a criticism of these in the light of Professor Fellner's own analysis), and two chapters on bilateral monopoly.

I think that this is, generally, an important book. Professor Fellner's analysis is stimulating and undoubtedly brings us one step nearer to reality.

W. J. L. Ryan.

Co-operative Industrial Research. By Ronald S. Edwards. Sir Isaac Pitman. 1950. xiv + 285 pp. 20s.

After a few pages containing some very penetrating observations on the subject of industrial research in general, and particularly on the part which a government should play, the author of this book states that "The present study is an attempt to make a small contribution to this discussion by an analysis of one of the most interesting developments of the last thirty years—the foundation and growth of co-operative Industrial Research Associations financed jointly by Industry and the Government".

This is an unduly modest description of a book which in about 270 pages contains an immense amount of information on the avowed subject of the book together with many profound comments on the general subject of industrial research.

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[1] This seems to be the only complete statement in English of Stackelberg's theories.

The author opens with an account of the reasons why the Research Association scheme was started in this country about 1917 and the history of its development. It is true that other books have been written covering much the same ground and there is a mass of information available in Reports of the Department of Scientific and Industrial Research (D.S.I.R.) but the historical section of the present work seems to contain all the relevant information set out in a very clear and readable way. This section of the book should be of special interest to people in other countries who are interested in the idea of co-operative industrial research because this method of carrying out research in industry is practically non-existent outside this country.

The Research Association scheme was started at a rather unfortunate time because, before the Associations had had time to find their feet, the first great slump occurred. It had been hoped by D.S.I.R. that the Associations would become self-supporting by the end of the first five-year period but this position was not reached partly on account of lack of capital, partly because of failure to appreciate how long it takes to set up a research organisation and to bring it into full working order, and partly because of the difficult economic conditions following the 1914–18 war.

It is gratifying to study, in this book, the attitude taken up by the Government, working through D.S.I.R., towards the Research Association scheme when it became apparent that the original financial estimates had been much too optimistic. With great enlightenment and courage, it was decided to continue to support the Associations financially for a second five-year period but with a modification of the basis upon which D.S.I.R. would supplement the income of an Association from its industrial supporters.

When the second five-year period finished the 19 Associations, which were then receiving grants from D.S.I.R., requested a continuance of financial support for a further ten years. D.S.I.R. replied that it could not accept the suggestion that grants should be on a £ for £ basis, but would consider the affairs of each Association on its merits as the financial contracts came up for review. This resulted in the various Associations receiving financial support, but on an appreciably less generous scale than they had suggested.

Unfortunately the Associations were faced, a few years afterwards, by the great slump of 1931–33 which resulted in a reduction both in their income from industry and also their grant from D.S.I.R., which had to effect economies throughout its organisation.

When the depression was passed the Government stated that they hoped to see the Research Association movement developed to a much greater extent than then existed as they felt that the then existing scale of operations was quite inadequate if the Associations were to serve their full purpose. The view was expressed that the Associations might expect their income from industry to be substantially increased in which case the Government would be prepared to augment its financial support. As a result in 1934 D.S.I.R. made new contracts with the Associations which were a good deal more generous than the contracts which they replaced.

When the author came to study the present position and future outlook for the Associations, he decided to make use of the questionnaire system. Altogether he obtained replies to his questionnaire from 225 firms of whom 190 were members of one or more Research Associations. It is pointed out that the sample is a very small one: only about 3 per cent. of all the firms who are members of one or more of the 27 Research Associations to which the 190 firms belong. At various points in his discussion Professor Edwards applies tests to find out, so far as is possible, whether the value of the reply to any particular question is likely to be vitiated either by the smallness of the sample or by the way in which the firms consulted were selected. In general the answers to the questionnaire seem to survive these tests very well so that considerable reliance can be placed on them.

It is not possible in this review to consider all the results of the survey but there are some which seem to be more interesting than others.

For example it seems that 60 per cent. of the firms who were members of Associations considered that they were getting real value for money; another 25 per cent. regarded their contribution as a speculation and only 6 per cent. contributed to an Association from a sense of duty.

The Associations also came out well in the replies to the question if the firms could recall any researches made by a Research Association which were regarded as solid contributions to the industry. 53 per cent. could recall examples and only 26 per cent. could not. The remainder gave no definite reply.

Opinions seemed to be more evenly balanced on the delicate question of whether or not the firms would willingly agree to an increase in subscription. 36 per cent. would agree, 33 per cent. would oppose and 31 per cent. gave no definite reply. It is not very easy to reconcile this with the question whether firms would continue their membership of Research Associations if the latter were not subsidised by D.S.I.R. Here 53 per cent. said they would continue, 14 per cent. would not and 11 per cent. stated that it would depend on the increase in subscription.

At this point in his book Professor Edwards has a fairly long section on the future of the Government grant and the basis upon which it is and might be determined, the introduction of a compulsory levy on industry to secure the industrial income, and possible methods of fixing the size of subscriptions. He comes to the conclusion that there is a case for continuing the Government grants provided, for reasons of public policy, it is desired to stimulate the activities of the Associations over and above the rate which would come about commercially. As examples he mentions the maintenance of war potential, the improvement of facilities for technical education and the reduction of the dollar gap.

The chapter on the "compulsory levy" contains an interesting historical note on a Bill which was introduced in the Commons in 1927 to give the Rubber Research Association powers to impose a compulsory levy. This Bill lapsed on account of congestion of business and the same fate befell a second Bill introduced in 1930. Finally a third Bill was introduced in the House of Lords and was ready to go to the Commons in 1933. It was then stated that there was evidence that a number of Rubber Manufacturers who were formerly in favour of the Bill had now changed their views so that the Government did not feel justified in proceeding with it. The Advisory Council of D.S.I.R. was in favour of a compulsory levy but in 1932 an enquiry showed that the great majority of the Associations were unfavourable to the principle as it was felt that if they came under the operation of a Statutory Order their liberty of action would be jeopardised and the personal interest of the more enthusiastic members might wane. Since then ideas seem to have changed somewhat because most of the Board of Trade Working Party Reports are overwhelmingly in favour of a compulsory levy. The Industrial Organisation and Development Act of 1947 provides powers to impose compulsory levies in support of co-operative research and orders have already been made under the Act.

Professor Edwards quotes several points against the compulsory levy which were made in the replies to his questionnaire. It is suggested, for example, that the enhanced sense of security might well lower the tempo of the work of the less energetic members of the staff and it is thought that a quite sensible lowering of efficiency could occur before enough of the members were brought to the stage of trying to do something positive about it. Undoubtedly it is important that members of an Association should have the right to signify their displeasure, if necessary, at the way in which the Association is run by withdrawing or reducing their subscription. Professor Edwards sums up by saying that the compulsory levy should not in general be adopted.

The chapters on the different kinds of research and other activities which a Research Association can properly undertake are full of valuable critical material. The question whether Research Associations should undertake confidential work on behalf of, and at the expense of, an individual member firm is discussed with the general conclusion that this is, on the whole, undesirable. This does lead on to a chapter on privately sponsored research in which reference is made to the possible desirability of setting up in this country institutions similar to the Mellon and Battelle Institutes in the U.S.A. D.S.I.R. has stated that it would not hesitate to go ahead with the setting up of such an Institute if it were satisfied that there existed a real demand for one in this country. In the meantime the Fulmer and Sondes Place Research Institutes, on a much smaller scale of course, have been set up by private initiative.

It is often stated that Institutes of this kind might well enable research to be done for small firms which are too small to be able to afford a viable Research Department of their own; but, although it is not mentioned in this book, by far the greater part, at least 80 per cent., of the research projects carried out at the Mellon and Battelle Institutes are commissioned by large firms in the U.S.A., and not small ones. The fact is that research is inevitably expensive wherever it is carried out so that no organisation can do good research cheaply unless it happens to have a very large endowment.

In the final chapter on the future of the Associations, Professor Edwards calls special attention once more to the importance of the Associations being run in such a way that they attract men of the highest class. He emphasises the fact that a laboratory with a high reputation automatically attracts good people and that once a decline in reputation has set in it becomes increasingly hard to prevent this decline from accelerating, as the grade of staff attracted by the Association will be continuously falling.

The book would be worth its price even if it were limited merely to the historical section but the greatest part of its value does rest, of course, on the light which an examination of co-operative research by a skilled economist is able to throw. It would be very interesting to read a future edition in, say, twenty years from now, to see to what extent Professor Edwards' views are borne out in practice; it would be safe to bet that very little of the material covered by the present book will need altering in such a future edition.

WALLACE A. AKERS.

Modern Capitalism and Economic Progress. By THOMAS WILSON. Macmillan. 1950. 274 pp. 12s. 6d.

Mr. Wilson describes this in his preface as " a book in defence of capitalism ". It covers, however, a somewhat wider field than either this or the title would perhaps suggest. Beginning with a brief discussion of the record of progress under capitalism, and the relations of capitalism and physical planning respectively to the central economic problem of resource-use and to democracy, he proceeds to consider in greater detail the record and the possibilities of liberal reform of capitalism in relation to inequality of income, industrial efficiency and monopoly, inflation, unemployment, and external equilibrium. This discussion contains also a considerable amount of specific reference to the post-war problems of the United Kingdom, with numerous excursions into the field of party politics.

With so vast a field to cover, the author has, naturally, been unable to deal in a profound analytical way with any one topic, and his approach does not display any striking novelty—it is essentially in the neo-classical tradition as modified by Keynes. It is certainly important to re-examine the record of modern capitalist economies with the instruments of analysis that have grown up with them, to compare their performance with that of other types of economy in recent times, and to appraise the results of their more radical recent departures from their traditional methods. All of this vast task Mr. Wilson has undertaken, and one is bound to admire both his boldness in undertaking it and the competence and lucidity with which he has carried it out. It may seem to the reader, however, that the whole of the task should not have been attempted in one book, and that the result before him falls between a strictly technical analysis and a debunking of popular errors. It may also strike him that Mr. Wilson spoils his de-bunking by a quite unnecessarily vigorous participation in the party-political battle, which will alienate many of those to whom his book should be addressed.

For the economist, the probably inevitable omission of a really satisfying comparison of progress under capitalism—at various stages of development—with progress in other types of economy will mean that more questions are asked than are answered. The challenge to the methods of the free economies today comes largely from the fact of spectacular progress in the U.S.S.R. and some other backward economies under authoritarian regimes, contrasted with the failure of private enterprise to produce rapid and satisfying results in, for instance, India or the colonial territories under economically liberal regimes, and with the record of temporary stagnation and generally more sober rates of progress in the mature capitalist economies. These contrasts need to be faced and seriously discussed ; it is not enough to compare (as Mr. Wilson does on p. 32) the Russian record over 24 years of which six years were years of war, with British progress in the late 19th century. Russian progress has been spectacular over short periods—1934–41, and 1945–51. It may be that these periods are not long enough to compare usefully with, say, the amazing rise of Japan under state-sponsored capitalism throughout the fifty years before the second world war, but they deserve attention.

In discussing the more familiar and specific charges against capitalism, the author is better served by the instruments of analysis which are ready to his hand. He has no difficulty in showing that income-inequality has been decreased in this country, and that the average of all personal expenditure on consumption, per head of the working population, is no more than 10 per cent. greater than the average earnings of an adult male wage-earner. For the further diminution of inequality of income, and of the far greater inequality of capital ownership, he places his faith entirely on redistributive taxation, including taxation of capital. A case can certainly be made for preferring this to other methods, but it is hardly justifiable to conclude (p. 135) that ' the socialisation of industry has nothing in particular to do with the greater equality of income or capital '. In so far as there are good reasons why private property is always likely to be more unequally distributed than private income, it is presumably true that a country where a high proportion of total property is in public ownership is likely to display a greater equality of incomes than one where a similar total quantity of property is mainly in private ownership.

Perhaps the weakest point in Mr. Wilson's discussion of the specific charges against capitalism is his failure to consider the actual circumstances of, at any rate, those industries where the arguments for nationalisation have been strongest. The arguments for nationalisation which are politically and economically important in this country have been, and will probably continue to be, special rather than general, and the efficiency of private industries in other countries where they are expanding, vigorous, and well equipped does not necessarily furnish an argument against the nationalisation of the corresponding industries here where these were old, declining, ill-equipped, and handicapped by third-generation entrepreneurship and bitter labour relations. Mr. Wilson does not, so far as I can recollect, say what he would have done with coal.

In the discussion of the problems of employment policy, controls of investment, inflation, and the external balance, the author is realistic and moderate in his main contentions ; he allows the necessity of some control of private investment, and proposes (as a long-run measure, and apart from the allocation of some one important material, such as steel, which he believes would have been effective in the post-war years) a discriminating income tax, which could be varied in its incidence between company reserves and purchases of new capital goods, as occasion demanded. He gives, also, general support to a location policy and to the use of subsidies or a 'stamp plan' to mitigate structural unemployment. Finally, in a chapter which could well have been omitted, he discusses the future of British capitalism in terms of the intentions, or surmised intentions, of the political parties.

The book contains much good sense and clear exposition on economic matters. It would have been better if, before (or instead of) inserting so many political asides, the author had exercised more imagination in understanding the strong and bitter social and economic roots of the often irrational beliefs and remedies which he attacks, and in making sure that his pages, addressed, presumably, to the unconverted as well as the converted, bear no trace of smugness.

A. J. Brown.

A Course in Applied Economics. By E. H. Phelps Brown. Pitman. 1951. 434 pp. 25s.

Modern text-books or treatises on economic theory tend to conform to one among a very few models in respect of the topics selected for treatment or the methods of exposition. The title "applied economics", however, is used by authors to cover not merely a wide range of topics (that is the necessary consequence of the nature of the subject), but also methods of treatment that are disparate. In his first chapter

Professor Phelps Brown notes this diversity. Applied economics covers, he says, " a wide range of problems in which the abstract and general bears a varying proportion to the concrete and particular . . . At one end of the scale are situations which, though more particularized than theory proper, are still abstract enough to be of some general application." These are problems " in which the way of working is much the same as in economic theory itself ". At the other end of the scale are " actual situations in all the detail that makes them historically unique ". In these problems theory has a limited part to play, though an essential one.

Professor Brown's plan has been to take a number of problems, all of contemporary importance, and to apply to each of the situations considered the appropriate dose of theory required for their interpretation. The problems, he says, " draw on most of the usual divisions of economic analysis, and illustrate its applications in various blends of the abstract and general with the concrete and particular ". For example, he begins with a study of the problem of monopoly (as representative of the analysis of supply and demand for particular products). About half of this section of the book is concerned with an exposition of the current theory of monopoly and imperfect competition, with illustrations drawn from history and current affairs. The rest of the section deals with public policy towards monopoly. Here the author examines monopoly in its historical setting, discusses the extent of monopoly power in various countries and finally considers the types of policy that have actually been followed towards monopoly. The same method is employed in Part II which is entitled " The Analysis of Supply and Demand for Factors of Production ". First, there is an exposition of the theory, and then come two chapters that deal with particular problems to which the theory has some relevance, viz. Equal Pay for Equal Work, and the Rate of Interest. Again, in Part III (" The Analysis of the Pricing System as a Whole ") there are, first, a theoretical discussion of the working of the pricing system in a collectivist society and, then, an examination of the practical problem of the pricing policy of the public enterprise. The two remaining Parts deal with Fluctuations and International Trade.

This method of treatment gives a unity and system to the study of applied economics that are seldom found in books concerned with more than one aspect of the subject. Moreover, although the choice of the topics seems to have been determined to some extent by a desire to cover " the main divisions of economic analysis " (as if the theory rather than the understanding of actual situations and problems was the main purpose of economic enquiry), the topics are all sufficiently important in themselves to justify their selection. The reviewer feels some doubt, however, whether the theoretical chapters, or parts of chapters, which occupy a good deal of space are really necessary in a book of this sort. The content of these chapters is such as is normally found in theoretical treatises or text-books with which the student is likely to have begun his studies. Professor Brown's object in including them is doubtless to emphasise the relevance of theory to the problems of the real world. But the juxtaposition of the theoretical and the applied chapters in each section carries the implication that the conclusions of economic analysis can be applied more directly to actual situations than is really the case or than the author would claim. As at the same time the juxtaposition in fact often reveals the narrow limitations of the theory, the result may be to leave the student somewhat bewildered. For example, in the section dealing with monopoly, it is apparent from the dual treatment of the subject that the conventional static analysis of monopoly and competition is of very little significance for the investigator of the dynamic situations that confront him in the real world, and that it affords little help to those who are working out or administering public policy towards monopoly. Professor Brown, in this section as indeed throughout the book, has made a most valuable contribution to our understanding of certain practical problems ; but the reviewer is left with the impression that the author's success is due primarily to the trained judgment of economic situations which he has brought to bear rather than to the guidance which his theoretical exposition gives in each case studied. Of course, theory has its part to play in the training of judgment, but its value is mainly indirect and general. These are debatable questions. But there can be no difference of opinion about the skill with which Professor Brown has handled a wide variety of applied problems. His book is distinguished by learning, insight and a calm judgment of practical issues. It is likely to be on the list of " essential reading " for students of economics for many years to come.

G. C. Allen.

London Life in the Eighteenth Century. By M. Dorothy George. Series of Reprints of Scarce Works in Political Economy. No. 12. London School of Economics. 1951. xii + 452 pp. 15s.

This book, a virtually unchanged version of its second edition (1930), makes a very welcome reappearance. The author's chief concern is with the less known sides of London's story. Its many poor, defective buildings, lawlessness and bad sanitation are given the emphasis reserved in guide books for nobler streets and commercial greatness. With the reservation that there is an under-emphasised prosperous side, her picture is vivid and intensely interesting. An introduction provides the frame for the subjects of the ensuing six chapters. In the social history of the century, her story runs, whatever may be true of the remainder of England, conditions in London improved from 1750 onwards. The devastatingly swift growth of population had slowed down. The organisation of the London trades, based on the skilled workman, the small workshop and the domestic system, changed surprisingly little, and the direct results of the industrial revolution were not conspicuous. While finance, administration, and the importance of the port grew, that of the city corporation diminished. The out-parishes were slowly organising themselves under Local Acts. The horrors of the gin years grew less after 1751. New hospitals, dispensaries and reformatory charities in the second half of the century and new school movements in the first half of the next produced a remarkable change. It was then no longer possible to "imagine us a people not only without delicacy but without government, a herd of barbarians". The introduction of stipendiary magistrates, better work-house organisation and the growing humanitarian movement combined to make it "impossible to escape the conviction of a gradually improving state of things". In this verdict of the author's, Sir John Fielding, Francis Place, Rickman and Rush, the American ambassador, all concurred. Ghastly as were the conditions in the early nineteenth century, they were better than those of the early eighteenth.

Chapters on "Life and Death in London" and "Housing and the Growth of London" amplify the points made in the introduction. "The key to the social history of London is to be found in its changes in population—its growth and the ratio between births and deaths." Up to 1750 deaths had exceeded births, thereafter the balance gradually changed. "Drink, ignorance and dirt", hitherto positive checks on the population, slowly diminished. The doctors could literally see the results of their good work.

Housing lagged behind. The orderly development of many great estates could not keep pace with the disorderly rush of the small builders. "Brown's" or "Robinson's" rents, run up with both eyes on immediate profit, made eighteenth century London notorious for its bad housing. Agar Town had still to come, but its many precursors and the alley building of the seventeenth century left areas notorious for generations—Field Lane, the courts off Holborn, in Petty France, in St. Giles, in St. George's, Southwark, and round where the London School of Economics now stands. There 1730 expected "frequent outcries in the night, fighting, robberies and all sorts of debaucheries", and 1830 typhus fever. There, and in many better areas, the norm was one family per room, social grades shown by the size of that one room, not by the tenancy of several. Common lodging houses and cellar dwellings made even such herding seem luxury. Yet, save where the inflow of Irish reversed this, buildings were increasing more rapidly than population, and foreign visitors, as the century went on, found the paving and lighting of the areas they visited admirable.

Throughout the century the flow into and outward from London was unique in Britain. Part seasonal, part would-be permanent, the largest, least popular and least skilled were the Irish. Crowded together in conditions no Englishman would accept, they remained a permanent problem, unsolved by the riots they started or caused. Foreign Jews were a lesser but similar problem. A smaller outward flow included indentured labour, men pressed for the Navy, and those sent by charities or workhouses, but the inflow clearly exceeded the departures.

The work for this mass derived from three main sources, London's position as the realm's chief port and distributing centre, its production of high-class wares of many kinds, and its position as purveyor to the world of fashion. Organisation within its trades ranged from the big capitalist to the small jobbing master but, save in declining or violently fluctuating trades like framework knitting or silk weaving, the trend of real wages was upwards. The author deals at length only with weavers and shoemakers but makes the essential general distinction between regular trades and the impossible variety of the unskilled casual workers. A whole chapter is reserved for the parish children and poor apprentices, covering the years from the London Workhouse of 1698 to the cotton mills of the early 1800's—a valuable account, well told.

A final chapter on "The Uncertainties of Life", ranging from tavern clubs to the apprenticeship system, from the curse of long drinking to the hazards of imprisonment for debt, while illustrating the ceaseless, careless fluctuations of life in London, renews the emphasis on the improvements in the second half of the century. The people were "becoming healthier, longer-lived, less subject to the calamities", and humanitarianism, having done much, was about to do more.

Such an account, republished 26 years after its first appearance, must date, and to this a reviewer must draw attention. Much work has been done amplifying or modifying what it pioneered—police and population are obvious examples. Its excellent references and bibliography are ripe for revision. Additional sources are now available to relieve the over-heavy reliance on Francis Place. But a reviewer can only conclude by whole-heartedly commending what he has so thoroughly enjoyed.

T. F. Reddaway.

Private Property: the History of an Idea. By Richard Schlatter. Allen & Unwin. 1951. 284 pp. 18s.

Professor Schlatter has written a very pleasant, readable and informing account of theories of property from Plato to Marx. Since (as the Preface tells us) the book originated in a course of lectures at Harvard, it has tended to yield rather too much, perhaps, to the demand for comprehensiveness, and in the attempt to be inclusive is inclined to drag a little in places through repetition of the same ideas over different signatures. Nevertheless, the book manages surprisingly well to preserve a continuous thread of analysis while at the same time lucidly summarising the main strands of doctrine ; stressing both the continuity of ideas and their relativity to changing historical conditions.

The larger part of the book is occupied with tracing the doctrine of natural rights in its many variants from the *ius naturale* of classical times to its waning popularity (in face of utilitarian doctrine) in the 19th century. To anyone concerned with the history of ideas the amazing persistence of this notion as a formal category of thought, despite radical changes in content and application, is of outstanding interest. Here the author is supremely successful in showing the relationship between these changes and historical change in general—in indicating the reflection of altered social relations and economic institutions in altered ideas about property rights and their derivation. In particular, he is illuminating in the manner in which he places mediæval or post-mediæval theories in the context of an assertion of bourgeois property rights against feudal custom and tradition, and shows the altered significance which these theories came to have when they were used against radical egalitarians (as, for example, Luther and Melanchthon used them against Hussites and Anabaptists and Ireton used them against the English Levellers). What he seems to be less successful in doing is in representing either the philosophical setting or the historical roots of the notion of natural rights itself in such a way as to make its persistence intelligible to a modern reader and in bringing these long-drawn controversies over its interpretation to life.

For the economist special interest attaches to the author's treatment of the Lockean version of natural-right doctrine, and of the contradictory double element inherent in it, wherein (the author implies) lay the germ of the eventual dissolution of the whole tradition of natural right. The notion that property rights were derived from labour and attached to what was created by human labour could be used, and later was used, not only as a defence of private property but also as an argument against inequalities in ownership and against inherited property. " In its heyday " the Lockean doctrine " seemed clear, distinct and true. Wherever property was widely distributed among groups of independent artisans and farmers, the idea that labour was the basis of ownership was readily accepted. Wherever property was monopolised by the inheritors of feudal privilege, the idea that labour ought to be the basis of ownership served as an argument for abolishing monopoly and privilege " (p. 160). At the same time " the natural rights tradition was revolutionary and equalitarian, and men who accepted the Lockean theory were sometimes led to attack all concentrations of property, capitalist as well as feudal " (p. 173). According to Professor Schlatter, the 19th century heirs of Locke were (despite the rise of Benthamism) the classical economists and Marx. " In one branch of speculation the natural right theory of property reigned supreme . . . The political economists of the classical school made it, in its technical economic form of the labour theory of value, the hub of their economic theory " (p. 181). Of Marx he says later : " However much Engels might minimize its importance, the theory that property rights should be based on labour was fundamental in Marx's work" (p. 275). This interpretation, however (which the author shares with many other commentators) seems questionable, and at best a superficial simplification. One is surprised that so little trouble is taken to justify it. That there was *some* lineal connection between Locke's theory of property and the classical theory of value is evident enough; that the latter owed much of its influence over contemporary thought to presuppositions implanted by the former may well be true. It is also true that a preoccupation with those economic relationships which were in some sense "natural", by contrast with those which were "institutional", underlay most 19th century economic discussion, and that Marx's distinction between two radically different kinds of property was, in effect, an answer to the ambiguity inherent in Locke's notion. But to suppose that in their theory of value either Ricardo or Marx were preoccupied with questions of moral right rather than with analysis of actual economic processes strikes the reviewer as taking the highroad to misunderstanding. Every economic theory has, inevitably, its moral implications, and the positivist attempt to divorce the two may well have gone too far. But to say that certain implications of a theory rest on a particular moral postulate remains distinct from the proposition that the theory itself is so derived.

M. H. Dobb.

Economic Consequences of Divided India. By C. N. Vakil. Vora & Company, Bombay. 1951. 556 pp. Rs. 21.

Now that the turmoil engendered by the achievement of independence and the division of the country into two great, but unequal, variously endowed, and essentially complementary parts has begun to subside, the immensity and fundamental nature of the economic problems arising from the partition of India are just beginning to be fully realised. Partition has, indeed, given a "new look" (and a new edge) to the familiar and traditional features and problems of the Indian economy.

Professor Vakil, and his collaborators, have performed a most valuable service by bringing together the available data bearing on this immense subject; by revealing—in strong relief—the new structure of the economic landscape that has emerged from the upheaval of 1947; and by presenting the various factors and arguments affecting the choice of economic policies and determining the attitudes adopted by the Indian Union and Pakistan, respectively, on a number of highly controversial matters.

For it is nothing less than a new economic landscape that has emerged. India and Pakistan have now to face not merely the ever present problems of population pressure and poverty, of underconsumption and underemployment, of lack of investment in the material and technical equipment of the country and of its population, of undue dependence upon primary production, and of the scarcity of capital and skill to remedy these defects. They have also to cope with the transitional dislocations due to partition; with the economic aspects (such as the altogether disproportionate expenditure upon defence) of the uneasy political relationships between the two countries; with the longer-term aspects of the refugee problem; with the new barriers between food-surplus and food-deficit areas, and between districts specialising in the production of raw materials and industrial districts dependent upon supplies; with the effects of the creation of two separate monetary and credit systems; and with the problems posed by the existence of "two rupees". Free exchange and mutual co-operation between India and Pakistan could do much to solve some of these problems, but the necessary atmosphere of friendliness and compromise has not yet been achieved, whilst the prevailing world scarcity of certain goods and the present rearmament movement seriously aggravate the search for solutions for all these problems.

Professor Vakil is to be congratulated on the admirable objectivity with which on the whole he has tackled his difficult task. Recriminations and useless regrets have been almost completely eliminated, whilst the contrasting attitudes and policies of India and Pakistan, respectively, have been explained with understanding and fairness. The reader can, no doubt, detect elements of bias from time to time, but this could hardly have been avoided in dealing with such controversial matters.

"Divided India" rightly concentrates almost entirely upon developments since 1947. The introductory matter necessary for understanding post-partition problems is presented with commendable conciseness.

An excellent account is given of the problems posed by the migration, on account of the partition, of some 16 to 17 million refugees. In the West the immensity of this problem, and the energy, spirit and resourcefulness with which it has been tackled, have hardly received adequate appreciation. The creation, at a moment's notice, of the organisation and administrative machinery required for the relief (and ultimately for the rehabilitation) of these millions of ignorant and helpless people (on both sides of the Indo-Pakistan borders) show what can be done, even by the relatively inexperienced and untrained, when faced by a tragedy of this order.

This discussion is followed by chapters on the problems raised by partition in the spheres of agriculture, mineral production, the generation of power, industrial production, development and planning, transport, trade, public finance and currency, banking and insurance. If only because of the much greater availability of data for the Indian Union than for Pakistan, more space is devoted to Indian developments and policy than to those of Pakistan, but in each case the characteristic problems and policies of the two countries are explained and compared.

Detailed comment is hardly possible in a short review of a work which covers so much ground. One omission may be noted: i.e. there is hardly any reference to land and tenure problems and policies. This may be justified on the ground that such problems and policies have not been specifically affected by partition, but a comparison of trends since 1947 in this sphere in the two countries would have been of great interest, whilst the Western reader, at least, would have warmly welcomed an account of the progress made towards the elimination of the Zamindari System. Agriculture, in general, has rather short shrift. Of outstanding value and interest are the chapters on the electrical and power projects, the textile industries and their potentialities, and those which analyse the contrasted objectives and policies of the two countries in relation to industrial planning, foreign trade and finance. In all Professor Vakil and his collaborators have provided a well packed storehouse of relevant data and well informed comment which will long be consulted by all who wish to understand the manifold economic problems of the Indian peninsula.

VERA ANSTEY.

Monetary Policies and Full Employment. By WILLIAM J. FELLNER. Revised edition. University of California Press. 1947. xxiii + 260 pp. $3.50.

It is seldom easy to review a book several years after its publication. With the passage of time its errors become clearer; and its contributions become generally accepted and are thus in danger of being regarded as platitudes. Professor Fellner's *Monetary Policies and Full Employment* originally appeared in 1946. A number of unfortunate circumstances have caused this long delay in the reviewing of it for *Economica*.

The discussion of monetary policy is to be found in the two final chapters. The preceding part of the book lays the foundation for this discussion. Fellner justly holds the view that we cannot regard investment as a simple function of either the rate of growth of consumption or the marginal propensity to consume. It is unfortunate that he does not elaborate more fully what are the forces guiding his "investment for further investment". He next examines at some length the "stagnation thesis". He is highly sceptical, and buttresses his scepticism with empirical investigation. Fellner stresses that we should not overlook the effects of changes in the composition of production. It is a valuable insight, though he is unconvincing in explaining why these changes occur. Finally, he investigates the power of monetary policy to affect investment through the rate of interest. He queries the Keynesian view that the interest elasticity of the demand for liquidity becomes great as interest falls; but it should be noted that he so defines his speculative balances as to exclude uncertainty. In Fellner's view, the primary weakness of this type of monetary policy is that investment is likely to be inelastic in face of falls in interest. This is so because of borrower's risk.

It is against this background that Professor Fellner considers anti-cyclical policy. He favours the use of a budget deficit, but where it is financed by borrowing from the central bank rather than from the commercial banks or the public. There are two reasons for this preference. If the demand for liquidity does not become interest-elastic, then borrowing from commercial banks or from the public will raise the rate of interest. Further, borrowing implies later interest payments, which necessitate taxes; and taxes have a disincentive effect. He recognises very clearly the dangers that will face a policy of full employment if private investment is chronically insufficient. He warns against the perils that will beset any policy of guaranteeing full employment. But he finds hope in that the trend and the cycle are not independent movements; and thus a successful anti-cyclical policy may stave off chronic underinvestment.

This is not always an easy book to read. Various aspects of it attract criticism, but there is also much that is useful and stimulating

A. D. KNOX.

Inventories and Business Cycles. By M. ABRAMOVITZ. National Bureau of Economic Research, New York. 1950. xxxvi + 632 pp. 42s.

The literature on business cycles contains a number of theories dealing with the movements of stocks; but empirical work on this problem has never been really adequate. Professor Abramovitz summarises the theories briefly in his first chapter and then presents a careful and detailed study of stocks held by manufacturing businesses in the United States. He has enormously improved our knowledge of how stocks behave during the cycle; but his work does suffer some limitation in its restriction to secondary industry. We are still, therefore, not fully equipped to bring Hawtrey's theory of distributors' stocks to the test of the facts.

Abramovitz first surveys the behaviour of total manufacturers' stocks. These vary positively with the fluctuations of national income, but with a lag of some 6 to 12 months. He points out, however, that it is not sufficient to consider the movements of total stocks, for it is possible to get a clearer insight into the reasons for and the significance of these movements by examining the behaviour of the various types of stocks. Indeed, we must break down our aggregates in our effort to understand, but we must also keep before us the aggregate of all categories of stocks when assessing their importance in the cycle.

Goods in process make up some 20 per cent. of manufacturers' stocks. There is little data available about them; but it is possible to reason safely about their behaviour, for they are intimately related to the productive process. They may be assumed to move positively with the cycle, and more or less synchronously. Investment in these stocks is, therefore, at its peak when the rate of growth of output is greatest.

Abramovitz found a little factual evidence on raw materials stocks, where these are defined as " goods purchased by manufacturers either from other fabricators or from manufacturers but not yet manipulated by their owners . . ." (p. 178). They account for 40 per cent. of manufacturers' stocks. The available data consist of statistics on some ten raw materials. By a skilful use of this evidence, buttressed by some *a priori* reasoning, Abramovitz is able to show that the stocks move more or less *pari passu* with output, but with varying lags. He rejects, however, the idea that the acceleration principle gives a satisfactory explanation of their behaviour. His reason is that errors of forecasting invalidate the simple acceleration principle.

Finally, there are the stocks of finished products : i.e., finished from the point of view of each manufacturer. As the other two types of inventories have been shown to move positively with the cycle, it is not surprising that stocks of finished goods move inversely for at least part of the time. Presumably stocks play the rôle of shock-absorbers in the economy, and it is a pity that Abramovitz has not devoted some space to an inquiry into their *raison d'être*. He has done this in some measure for goods in process and raw materials, but we receive from his book no clear idea of the motives controlling inventories of finished goods. " To some extent even larger accumulations can be tolerated in order to cushion the rate of operations against the impact of declining sales. But after a point stocks become intolerably large and firms are forced to cut output . . ." (p. 319). But where that point lies does not appear. This is not something that Abramovitz's material would reveal. There is a need for case studies into the motivation of stock holding to supplement his work.

Professor Abramovitz has examined the available data with skill and with scrupulous care. As he notes on several occasions, the limitations of the data have forced him to leave many questions unanswered. He has in consequence not said the final word on stocks and the cycle. Without doubt, however, the starting point of any further work on this subject must be a careful study of *Inventories and Business Cycles*.

A. D. KNOX.

Soviet Trade with Eastern Europe, 1945–1949. By MARGARET DEWAR. Royal Institute of International Affairs, London and New York. 1951. vii + 123 pp. 8s. 6d.

In this admirable study Miss Dewar has brought together from a number of published sources such data as are available on the nature and extent of the exchange of goods between Czechoslovakia, Poland, Bulgaria, Hungary, Roumania and Yugoslavia on the one side and the U.S.S.R. on the other from the end of the war in Europe to the end of 1949. The most serious deficiency is that concerning prices, about which Miss Dewar says, " but it does seem that prices charged by the U.S.S.R. tend to be high and those offered low, especially when it is a question of buying goods for re-export (Roumanian grain, Bulgarian tobacco, Yugoslav metals, Polish coke) on which the U.S.S.R. no doubt makes considerable profits ". This makes a general assessment of the various agreements extremely difficult, particularly when coupled with the further points that it is rarely possible to find out how far the agreements were carried through and often impossible to obtain absolute figures. The iron curtain has, in these matters, very largely done its work. Despite all this and the many exaggerated claims (which Miss Dewar discounts), several interesting conclusions emerge. It is shown that while the growth of the Soviet share in the trade of Eastern Europe is very considerable, it has not reached the volume of Germany's pre-war trade with Eastern Europe. Miss Dewar has detected few signs of attempts to create an economically self-sufficient area in the East and feels it highly unlikely in the future. Several trade agreements are reproduced in full as appendices to this useful study.

D. J. MORGAN.

The Monetary and Banking System. By G. W. WOODWORTH. McGraw-Hill Publishing Co., New York. 1950. xvi + 588 pp. 42s. 6d.

A Discussion of Money. By W. A. L. COULBORN. Longmans, Green & Co. 1950. xiv + 356 pp. 18s.

Neither of these books is a very satisfactory text. Admittedly, it is difficult to combine successfully a discussion of monetary theory and financial organisation within the covers of one book. The field is too vast to make this an easy task. Nowadays, the requirements would probably be better met by specialist texts, which need not be unrelated and which can still fulfil the requirements of elementary exposition. However, if we assume that there is a need for compact texts, which purport to cover both theory and description, there is the further problem of arrangement and integration. If two volumes are thought to be impossible, there is still much to be said for a treatment in two parts. Most texts begin with some elementary monetary theory and this provides a necessary background to a discussion of institutions. In this respect, Coulborn has met the reviewer's requirements more exactly, since most of his material on institutions follows the survey of theoretical principles. Woodworth, on the other hand, believes in shifting from one to the other. He attempts to justify this as an effort " to integrate the fields of money and banking into a unified whole, thus breaking away from their traditional division into two separate compartments . . . it stresses the interwoven pattern of the entire subject." The present reviewer has no necessary respect for tradition and prefers to judge by results.

In this case the end-product does not please him. It is too disjointed. The reviewer must also confess to another prejudice. It has become popular in America to produce omnibus texts. This has been due to quite a different approach to education. Possibly, it is not meant to result in spoonfeeding, nor to represent a substitute for the reading of original source material, but these are both very real dangers. Worse still, the treatment inevitably tends to be superficial. Analysis gives way to dogmatism and " historical background " is reduced to a catalogue of events. Woodworth offends very much on these grounds. For example, such analysis as there is of " inflation " and " deflation " is confined to little more than half a page (pp. 36–7). Nothing useful can be said in that compass. The business cycle receives slightly more generous treatment (pp. 358–77), but even as a summary it is most inadequate. Again, in a " sketch " of financial developments, we find a catalogue of money and banking experiments (pp. 104–6). Certainly, it is desirable to provide perspective, but your reviewer doubts very much whether this is the way to do it. All that is needed, surely, in a text of this description is a broad historical background, with an occasional use in later chapters of the " flashback " technique. For example, the place to refer to the " safety fund system " (p. 104), if it must be mentioned, is when the author comes to deal with the modern institution of deposit insurance. Cluttering up the earlier part of the text with unrelated snippets of history serves no useful purpose. If students want to read early banking history, they should look for it in the works of economic historians. All this sounds most ungrateful, and the reviewer would be lacking in his duty if he failed to observe that the reader in this country can find in Woodworth some quite useful chapters on the organisation of banking in the United States. In particular, Chapters XXX and XXXIV on the American money market draw together much scattered material and add considerably to our understanding of the markets for government securities, brokers' loans, commercial paper, and bankers' acceptances. There is, in addition, an indication that Professor Woodworth would have been far happier in his exposition of theory if he had attempted to be less all-embracing. On those occasions when he has given himself some elbow-room, he has done much better. Thus, his survey of Keynesian theory and its relations with the Swedish School (pp. 386–400) is much more adequate than certain of his other sections. There are, however, clear signs that he has failed to keep up with the more recent literature. Indeed, the treatment throughout seems to be rather old-fashioned, and, despite the views of the author, one does not have to be a Keynesian to find it so.

Professor Coulborn's book is little more than a second edition of his earlier *An Introduction to Money*, though it has been very largely re-written. In some ways the reviewer prefers the older book, which was presented in a more straightforward manner. He also found it difficult not to be annoyed by the intrusion of dialogues between a certain Prof. Harp, " with his analytical insight ", and Dr. Carp, " full of sound City sense " (more loquacious successors respectively to the Prof. Hoot and Dr. Coot of *An Introduction*). Coulborn is less ambitious than Woodworth and his theoretical discussion is more thorough. He also leads into his analysis of institutions (primarily, in this case, British institutions) much better and the presentation is less disjointed. The reviewer's chief complaint relates to the rather too complete acceptance of Keynesian analysis. Thus, the trade cycle is described wholly in Keynesian terms and, indeed, he goes so far as to state that this analysis " accounts for all the features of the trade cycle ". Again, he states (at p. 167) " the belief that for Britain, and, indeed, for developed countries in general . . . the bias of the economy will be . . . *naturally* towards deflation and not towards inflation ". Ignoring the protracted defence commitments of the Western democracies, which could not perhaps have been foreseen in July, 1950, Professor Coulborn, had he been less persuaded by the Keynesian dogmas, might have appreciated the degree to which fear of the " bias " he asserts has itself resulted in the implementation of over-full employment programmes and that we are, in fact, more likely to live through a period of persistent and not-so-slow inflation. While Woodworth's addiction to the " conventional method " (i.e., the Quantity Theory) may have seemed old-fashioned, Coulborn's naïve application of depression economics to the circumstances of to-day and to-morrow seems no more realistic.

J. S. G. WILSON.

Industrial Conciliation and Arbitration in Great Britain. By IAN G. SHARP. George Allen and Unwin Ltd. 1950. 466 pp. 25s.

The machinery established in this country for the settlement of industrial disputes has grown up haphazard over the past hundred years and is of an extremely complex character. Today most industries have their own system of joint negotiations, but this varies widely from industry to industry. It is a curious fact that this field of voluntary administration—which is the most highly developed in the world and of immense importance to the welfare of the community—has been almost ignored by students of social relations. The first part of this survey by Dr. Sharp fills a long-standing gap by tracing the development of the machinery operating in seven of Britain's major industries ; coal, iron and steel, engineering and shipbuilding, cotton, building, boot and shoe and the railways. The second part, which covers ground better known, reviews afresh the role of the state in the promotion of sound industrial relations.

As a source of reference to historical facts this book is invaluable. Good as the book is in this respect it leaves the reader with the feeling that it would have been better still had Dr. Sharp deepened his historical description with an attempt to answer some of the many teasing questions as to why one form of machinery grew up in one industry and not in another; and with some comparisons of the way in which the different types of machinery work in practice.

Although both sides of industry have shown a readiness to establish their own machinery to resolve conflicts between them, with the integration of industry and the growth of large scale trade unions and employers' associations, the state has been compelled to supplement these private arrangements. The principle underlying state intervention in the field of industrial relations has been that of promoting voluntary collective bargaining and the settlement of industrial disputes by consent. Since the Conciliation Act of 1896, the Labour Department of the Board of Trade, and subsequently the Ministry of Labour, has been empowered to assist the two sides of industry to reach an agreement, when in conflict, through the use of conciliation officers; and, when deadlock could not be broken, to provide facilities for arbitration. These services to industry were extended by the Industrial Courts Act of 1919, which established a permanent Industrial Court for the voluntary submission of disputes, and gave the Minister of Labour further power to conduct investigations into any aspect of a trade dispute.

Where industrial conditions have deterred the development of trade unions—thus making collective bargaining impossible—the state has attempted to encourage their growth by providing machinery such as Trade Boards and Wages Councils with compulsory powers to fix minimum wages, of which the trade unions could take advantage. These departures from the voluntary principle, as Dr. Sharp points out, do not signify any loss of faith in voluntary methods. " Viewed in their correct perspective they are nothing more than temporary statutory crutches to industries where joint organisation is temporarily weakened or has not yet grown to sufficient strength to bear, unsupported, the full weight of industrial relations."

The continuation of compulsory arbitration during the post-war years has, perhaps, been a more serious departure from voluntary methods. However, even here the departure has been much exaggerated, for compulsory arbitration has been only marginal in its effect; the vast bulk of wage claims and other disputes have been settled by voluntary machinery. Compulsory arbitration has always been regarded as a purely temporary measure, and the Order imposing it is now repealed, restoring the right to strike. Whether or not under conditions of full employment, and a constant inflationary pressure, purely voluntary methods of wage negotiation and the settlement of industrial disputes will work without disaster, depends on the sense of responsibility shown by trade unions, employers and Government.

This book was substantially written in 1940—publication being delayed by the war—and revised in 1947 to include wartime developments; the post-war period is, therefore, hardly dealt with. A detailed study of the last decade and an evaluation of wage-fixing machinery in the light of modern industrial and economic problems would be invaluable at the present time, but it would be unfair to Dr. Sharp to criticise him for not having written a different book—he has given us something badly needed, a good historical survey of the formal framework of industrial conciliation and arbitration.

B. C. ROBERTS.

SHORTER NOTICES.

Exposes D'Economique. I. Introduction Générale—L'Apport Des Ingénieurs Français Aux Sciences Economiques. By F. DIVISIA. Librairie de Médicis, Dunod, Paris. 1950. xii + 157 pp.

This is the first of a series of specialists monographs, partly the fruit of Professor Divisia's researches, and partly extracted from his courses at the École des Ponts et Chaussées, the Conservatoire des Arts et Métiers, and at l'École Polytechnique. Himself an engineer and economist, Professor Divisia was invited to address the centenary meeting of La Societé des Ingénieurs Civils on the subject of this monograph. The work begins with a chapter on Les Grands Pionniers, namely Cournot, Dupuit, Walras, Colson and Le Chatelier. Professor Divisia then goes on to comment briefly on a very wide range of problems and books, nearly all French, some in the field of mathematical theory, some on the history of thought, and some on various applied problems. Monetary theory, the theory of interest (M. Allais) the conditions of economic progress (Clark and Fourastié) are also touched upon. The connecting thread is not always very strong, and a background knowledge of contemporary French controversies on problems of mathematical and also applied economics is assumed in the reader.

Technique de la Banque. By HENRI ARDANT. Presses Universitaires de France, Paris. 1951. 136 pp.

This little book, written from the point of view of the practical banker, is a useful addition to the " Que sais-je ? " series of handbooks, and to the bookshelf of the student of comparative monetary institutions. It is mainly concerned with outlining the technical details and practical rules of the French commercial banker, for the benefit of the non-technical reader. English readers will probably regret the absence of more detailed discussion of the results of the nationalisation of the four big banks, and of the practical effects of the policy of the National Credit Council and Central Risk Information Service.

British Industries and their Organization. By G. C. ALLEN. Longmans, Green & Co. 1951. Third Edition. xi + 289 pp. 17s. 6d.

This is the first genuinely post-war edition of a book that has been used for many years by students at all stages. It has been very largely rewritten and, though the approach remains historical, " the centre of interest has been shifted to the condition and organization of British industry in the late nineteen-forties ". Typical changes are the expansion of the engineering chapters and a new chapter on rayon. Building, though an old industry, now appears for the first time. The chemical industry remains a notable absentee. The wealth of knowledge and the art of compression that have gone to the making of this new edition should win for Professor Allen the gratitude of teachers and students alike.

Ondernemingsbesparingen, Risicodragend Kapitaal en de Omvang der Bedrijvigheid. By F. W. C. Blom. Capita Selecta der Economie no. IX. Stenfert Kroese's Uitgevers-Maatschappij, Leiden. ix + 298 pp. Fl. 11.75.

This book is concerned with various aspects of business saving, a subject which has not received the discussion it deserves, for most theorising about the consumption function is concerned only with the relation between consumption expenditure and consumers' income. The main stress is laid on the qualitative importance of business saving.

The first half of the book is taken up with an interesting though discursive treatment of a large variety of topics such as the motives for business saving, the concept of a sound financial structure, the imperfection of the capital market and the effects of inflation upon business saving.

Chapter V makes a contribution to trade-cycle theory which, as the author himself says, is related to Kalecki's work. It may be called a financial over-investment theory. During the boom firms are optimistic and borrow a good deal to finance their investment. Later on, when profit expectations cease to rise, they will look more critically at their financial structure and wish to raise the proportion of risk-taking capital. If there is a crisis on the stock market this can only be done by saving more and using (gross) savings to reduce debt. Thus dividend payments and investment will both fall and the slump begin. One factor determining its length is the time required to restore the proportion between risk-taking capital and debt to a sound level.

The book concludes with an examination of what measures may be taken to remove the structural shortage of risk-taking capital so that the stability of the economy is increased. Altogether the author has made many interesting points and raised some important questions.

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Marshall's Principles of Economics in the Light of Contemporary Economic Thought[1]

By C. W. GUILLEBAUD

The first edition of Marshall's *Principles* came out in the year 1890—more than 60 years ago. If it is true, as I believe, that everything that was important in his thought is to be found in that edition, and that when he did add new material he was merely drawing on the vast storehouse of knowledge and ideas which he had accumulated and worked out during the preceding 20 years, then it is a very remarkable fact (probably unique in the whole field of organised knowledge in all subjects) that this book should still be a standard text-book, and one that no Final Honours student in Economics could afford to neglect.

One may ask, to what peculiar quality or combination of qualities does the *Principles* owe its survival today, when so much of the general background against which it was written, the economic structure of late Victorian England, has passed away?

One of Marshall's major preoccupations was to forge tools of economic analysis which could be used in the handling of actual problems. Hence his preference for the method of partial equilibrium and his distrust of the value of conclusions that could only be reached on the assumptions of a stationary state.

Associated with this is the fact that the keynote of the *Principles* is that it relates always to a dynamic world of change and movement and that all his tools are chosen with a view to throwing light on the working of economic forces in such a world. Hence such typical concepts as the representative firm, his time analysis of value, etc. In all this he was greatly helped by the fact that, as Schumpeter has pointed out, he was "an economic historian of the first rank," which means that he had a fundamental sense of process.

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[1] This article contains the substance of the second of two lectures on "The Evolution of Marshall's Principles in the Light of Contemporary Economic Thought" delivered at the London School of Economics on February 29th and March 7th, 1952.

Throughout the whole of the text of his book, Marshall kept his feet firmly on the ground, relegating to footnotes and appendices—especially the Mathematical Appendix—the more subtle points likely to be of interest only to the professional economist. On the one hand this habit is an infuriating one for the professional economist, who only gets hints of what he feels Marshall could have told if he had thought fit. On the other hand, because he sticks to the major issues, *because he never forces an argument or a theory to a logical conclusion where it loses touch with reality*, because his main interest is in the wood even more than in the trees, he contrived at one and the same time to produce a work which was of major importance for the development of economic theory, and to relate his analysis all the time to that real world in which we live and move and have our being.

The one qualification that has to be made to this—and it is an important one—is that Marshall in his *Principles*, "Vol. I" as he called it in his first five editions, "An Introductory Volume" thereafter, deliberately abstracts from the fluctuations of economic activity caused by the Trade Cycle. But I would like to point out that on pages 710–11 of the *Principles*, in just over one page, Marshall gives a theory of trade fluctuations which includes waves of optimism and pessimism, the shortage of effective demand, the multiplier, and the accelerator—it is all there. Professor Robertson holds that it is still the best short account of the trade cycle in the whole of economic literature. I might add that the passage in question was taken bodily from the early *Economics of Industry* of 1879.

Despite this qualification, I have often questioned economic students of mine who have gone into business and have come in to see me after an absence of some years. I have asked them, "What in economics have you retained in the light of your experience of the world of practical affairs?" Almost without exception they have replied, "All the high-power theories and refinements that we were taught and had to get up for the Tripos have faded away completely. The only thing that remains valid and always in correspondence with the facts of business experience is Marshall. There is nothing there to unlearn."

Withal, the *Principles* remains a difficult and in many ways an advanced book. One recalls the phrase, "Bearing under the garb of literature the armour of mathematics," with which Edgeworth once characterised Marshall's work.

For the student I think there are two main obstacles.

First, there is the difficulty of bringing Marshall to a focus. The sentences flow evenly and smoothly and each one by itself is perfectly intelligible and apparently simple; but having read a paragraph, a section or a chapter the problem remains—what was Marshall really driving at, what does it all amount to, where are his important conclusions ?

It was a distinguished Italian economist who said that an economics student is beginning to understand something about the subject when he comes to realise that the *Principles* is not an easy but really a very difficult book. The flowing, almost conversational style, masks the real difficulties and the student is left to find them out for himself.

The second obstacle is of a very different order : it consists in what Keynes called Marshall's " moralising imp "—those phrases expressive of Victorian piety and morality that the present generation finds almost intolerably tiresome.

I would like to quote two passages, each very characteristic of its author, which express a reaction against this side of Marshall.

The first is by the American, Talcott Parsons (*Quarterly Journal of Economics*, February 1932) :

" Englishmen have often ridiculed Hegel for supposing that the evolution of the Weltgeist had taken place solely for the purpose of producing the Prussian State of the early nineteenth century. And yet Marshall, good Englishman that he was, supposes that the whole process leads to the production of the English business man and artisan of the latter part of the same century. With all due respect to those worthy gentlemen, does any one really suppose that they alone will inherit the earth ? "

He went on to say :

" I am not concerned here with disputing the ethical validity or propriety of Marshall's ethical conviction of the supreme value of one type of character. What is important is whether such subjective ethical conviction should be allowed to colour the whole perspective of the past and present tendencies of social development as it undoubtedly does in the case of Marshall. The complete disregard of most other things which it entails is a narrow-mindedness hardly compatible with the ideal of scientific objectivity."

The second is by Schumpeter (*American Economic Review*, June 1941):

"I confess that few things are so irritating to me as is the preaching of mid-Victorian morality, seasoned by Benthamism, the preaching from a schema of middle-class values that knows no glamour and no passion. But that does not alter the fact that the vast majority of Marshall's readers [*sc.* in 1890] felt differently, and that they welcomed an analysis which was thoroughly imbued with what to them was the only right and decent spirit."

Any one who has known Schumpeter personally must regard this passage as being as revealing in relation to Schumpeter himself as it is interesting as a commentary on Marshall.

The one piece of practical advice that I would give to students of economics of the present generation, who read the *Principles*, is to pass over, without too much feeling of annoyance, those passages which are a reflection, in Schumpeter's phrase, of Marshall's "mid-Victorian morality seasoned by Benthamism", and to be not less tolerant of this sort of common form of the Victorian era than are those many good judges of literature of the present day who rightly esteem *Middlemarch* by George Eliot to be one of the greatest and most enjoyable novels in the English language.

But the *Principles* is also a difficult book for the professional economist, partly because of Marshall's inveterate habit of leaving the context to explain his meaning. He combined this with an altogether unjustified belief that his professional colleagues would do him the credit of endeavouring to make sense of what he was trying to say, *in the light of his whole system of thought.* Even if few economists have misunderstood him as egregiously as did H. J. Davenport in his book so misleadingly entitled *The Economics of Alfred Marshall*,[1] his work has given rise to many controveries and misconceptions, which could have been avoided if he had explained his meaning more precisely. Even Edgeworth in the early days found himself at fault in this respect, and was frequently taken to task by Marshall for misinterpreting him.

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[1] Cf. "Davenport on The Economics of Alfred Marshall" by C. W. Guillebaud, *Economic Journal*, March 1937, pp. 21–43.

I am accustomed to tell my pupils that the answer to many questions in economics, theoretical and applied, depends upon whether one is postulating a Keynesian or a Marshallian world.

The Keynesian world is relatively simple, it is a state of affairs where there is a large shortage of effective demand and a large amount of unemployed and idle factors of production—land, labour, plant and machinery—and big stocks of more or less unsaleable raw materials and also it may be finished goods. It is further associated with an abnormally high degree of liquidity preference.

The Marshallian world is a more complex matter. It is not in the least static—it is in fact a world of ceaseless movement and change. Population is increasing (or it might be diminishing), capital is growing, tastes are changing, technique is altering. Some industries are expanding, while others are contracting, and the same is true of the individual firms within each industry. Not only is there seasonal and frictional unemployment of labour (the ins and outs) but there is also structural unemployment due to changes in tastes and demand on the one side, and in technique and inventions on the other. But the aggregate volume of unemployment is not so large as to indicate an overall shortage of effective demand.

In a very broad and general way the Marshallian world assumes the validity of Say's Law—above all it assumes that the whole volume of *ex ante* saving is converted through the normal working of the capital market and the banking system into an equivalent amount of *ex post* investment. To use a Wicksellian (not a Marshallian) term, the natural and market rates of interest are in equilibrium at a moderately high level of employment. While there is not a lot of idle capacity in the Keynesian sense, there is sufficient reserve capacity to enable any given industry to expand its output in the short period in response to an increase in the demand for its products. The scale of output of individual firms is such that in general the short-period supply curves (marginal prime cost) are inclined positively for any expansion of output. The general price level is reasonably stable. Under these conditions the size of the real national income is determined essentially by the volume and efficiency of the factors of production; and, most importantly, the volume of investment *ex post* is determined *and limited* by the volume of saving *ex ante*, while the rate of interest expresses the equilibrium at the margin of all the forces influencing the demand for and supply of capital.

This is clearly a very different world from the Keynesian, where the size of the real national income is governed essentially by the extent to which a given, more or less fixed, stock of factors of production is *employed*, i.e. on the level of employment, and where it is the volume of investment which determines the volume of saving, while the rate of interest is primarily influenced by the state of liquidity preference.

Finally I would point out that the Marshallian world is in no sense one in which equilibrium is ever attained. The whole of the doctrine of quasi-rents, which plays so important a role in Marshall's short-period analysis, assumes the absence of actual equilibrium. But at all times the forces making in the direction of equilibrium are present and are potentially if not always actually at work; and whenever the *degree* of disequilibrium is sufficiently great to overcome the resistance due to such factors as the costs of change, ignorance, inertia and all the other frictions human and economic, then these forces start to operate, and their direction, though not it is true their strength, can be foretold on the basis of equilibrium analysis. The rule of law is thus revealed amidst all the jungle, the incredible complexity, of economic phenomena; and, as Marshall often said, the real task of the economist is to look not for the causes of things but for the causes of the causes of things.

I have brought these two worlds into contrast, not in order to show that one is right and the other wrong—each is equally valid as a possible picture of the real world; they differ from one another rather as do two widely opposed phases of the moon. But woe betide the student who applies to the one the reasoning appropriate to the other.

That which I have described as the Marshallian world is in my opinion that phase of economic activity which is postulated in his *Principles of Economics*, and it is necessary to bear this constantly in mind when reading it, and further to remember that Marshall had always intended to follow up the *Principles* with a volume dealing with economic fluctuations. This is not the *whole* of his system—it is only the ground floor on which the upper storeys were to be added later. It is a misfortune that he should have devoted so much time to revising the *Principles* (seven years in all out of his working life) instead of producing the other volumes he had intended to write.

For a good many years after the publication of the well known books on Imperfect or Monopolistic Competition by Mrs. Joan Robinson and Professor Chamberlin, there was a strong tendency observable, not least in his own University of Cambridge, for economists, but particularly for students, to say: " Poor old Marshall, he has become completely a back-number ; he is *vieux jeu* and superseded by a more up-to-date, more realistic, and more exact type of analysis ; there is no need for us to bother with him any more ".

More recently, however, there are many indications that the tide has turned. Marshall has increasingly been coming back into favour, while the doctrines of the imperfect-competition school have themselves been subjected to criticisms which have stripped them of a good many of the pretensions to which originally they laid claim. There is possibly a certain significance to be found in the title of the second of the five lectures given by Professor Stigler in 1948 as Visiting Lecturer at the London School of Economics. It was: " Monopolistic Competition *in Retrospect* " (my italics).

In the little that I have time to say on this subject I would point out to begin with that the basic theory of imperfect competition is clearly stated in the *Principles* both in the text, in footnotes and in the Mathematical Appendix—actually it was formulated more clearly in the earlier editions than the later.

Thus in the third edition, Book VI, Chapter 1, after saying that the marginal shepherd adds to the total produce a net value (20 sheep) just equal to his own wages, there was the following footnote, which was abbreviated in the fifth edition :

" Theoretically a deduction from this has to be made for the fact that by throwing twenty extra sheep on the market, the farmer will lower the price of sheep generally, and therefore lose a little on his other sheep. This correction may be of appreciable importance in special cases. But in general discussions such as this, in which we are dealing with a very small addition to the supply thrown by one of many producers on a large market, it becomes very small (mathematically a small quantity of the second order) and may be neglected. In the case of a monopolist who supplied the whole of a market, we had to take account of it; and also when discussing the considerations that induce any producer, or association of producers, to abstain from 'spoiling' that particular branch of a large market with which they are directly concerned, especially in times of depression. This point is discussed at some length in Mathematical Note XIV, the whole of which has a close bearing on this section, and the reader may be asked to reckon it in as part of the present discussion."

In other words—to use current technical terms, where the demand curve for the output of an individual producer slopes downwards, it is not the *value* of the marginal net product that is relevant but the marginal *revenue* resulting from the sale of the marginal physical net product.

The whole of the *Principles* is, indeed, riddled with statements and arguments which imply that competition is not assumed to be perfect.

The main complaints that in my view can be brought against what I might term the imperfect-competition school are:

Firstly, it has clouded and bedevilled the issue by drawing a false antithesis between an idealised and purely imaginary perfect competition on the one hand, and varying degrees of monopoly on the other, and by contending most unjustifiably that the whole of the Marshallian system depends upon the existence of perfect competition as they have defined it. Incidentally, the concept of long-period competitive equilibrium where every firm is of optimum size is completely non-Marshallian. He would immediately have objected that this is the equilibrium of the stationary state, from which his own conceptual long-period equilibrium differs above all in the fact that it must not be thought of as a *continuing* condition. The moment it has been achieved (conceptually) it has served its purpose, and it vanishes from the scene.

Secondly, and in many ways more important, is the charge that the imperfect-competition type of analysis, when used as an *alternative* and not as it should be a *supplement* to Marshall, virtually deprives us of any general working theory of value at all. This is carried to its logical conclusion—I would prefer to say, to its *reductio ad absurdum*—in the work of Triffin, who on grounds that seem to me merely pedantic, would deny any validity to the notion of an industry, and would require every single firm to be regarded as a separate industry, each having its own market, with the price determined simply by the elasticity of its particular demand curve in relation to its marginal-cost curve. The only result of this is the complete disintegration of the theory of value; it is not merely a breach with the continuity of economics as a science—it is a relapse from order into anarchy and chaos.

Thirdly, the imperfect-competition school tends to look only at the trees—the individual firm, and almost wholly to ignore the wood—the industry. Marshall *was* interested in the trees, but he was still more interested in the size and shape of the wood. What he regarded, and I think rightly, as of primary importance, was the study of the forces which will determine whether through time an industry will expand or contract or remain about the same size, and how the values of the things it produces move in relation to the values of other things.

I do not wish to dispute the usefulness or importance of the work that has been done by the pioneers of this school and their successors: they have cultivated with profit a fruitful field; but they have also done real harm to economics (and Keynes, on other grounds, is open to the same accusation) by stressing the apparent breach with the general development of economic thought instead of, as they should have done, the continuity of their work with that of the past.

The whole Marshallian system of value theory, itself derived from the classical economists, is that there is such a thing as *normal value* to which the price of any article tends to conform. This normal value corresponds to that at which the long-period marginal demand price and the long-period marginal supply price in respect of a given output are the same. It follows from this that two articles A and B will tend to exchange against one another in the ratio of their long-period money costs of production at the margin and their relative prices will tend to express this ratio. This is *not*, of course, a cost-of-production theory of value, (*a*) because, as Marshall was always insistent, the relation of cost to value is never direct but always indirect—cost influencing supply and supply in conjunction with demand determining value; (*b*) because it follows from the laws of returns that changes in the level of demand will influence costs themselves. Marshall's familiar blades-of-a-pair-of-scissors illustration should absolve him from any charge of neglecting the influence of demand upon value.

It is round this long-period normal value that short-period prices and market prices fluctuate.

But I would add the important reminder that normal value in general and long-period cost in particular must not be thought of as stable through time, but as changing with every alteration in the long-period conditions themselves.

Now you can only get a strictly determinate answer to this question as to what is long-period cost at the margin, if you assume competitive conditions—for only then is it true in pure theory that the equilibrium price expressing normal value is equal to marginal cost, and that marginal cost for the industry (i.e. marginal supply price) is equal to the average total costs per unit of output of the representative firm, including a normal profit.

How is this theory of normal value affected by imperfect competition ?

In the most common case of a multi-firm industry with product differentiation but fairly free entry, it is likely, as Stigler pointed out, that the elasticity of demand for the products of any one firm is likely to be large, with the result that there is very little *practical* difference between this and the assumption of perfect competition. The marginal revenue curve will lie only just below the average revenue curve, and competition is likely to prevent the firms *as a whole* in the industry from earning through time more than normal profits for that type of industry.

In the case of oligopoly the broad Marshallian analysis solves the problem of apparent deadlock, when the price seems suspended in mid air because it cannot follow changes in the marginal-cost curve (I am thinking here of the familiar kinked demand curve) because as soon as forces acting on the side of either demand or cost are sufficiently general to affect *all* the firms in the same sense and direction, they will all act together, either with or without prior consultation, as is the case in a highly competitive industry. Even in oligopoly I doubt if the divergence of marginal from average revenue is necessarily very important, especially if as so often happens they all fix the same agreed price.

What *is* important here, and wherever there is a high degree of concentration of production (a large element of monopoly), is that the notion of a representative firm breaks down and it is impossible to give a sharply defined meaning to normal profits where free entry is seriously restricted for whatever reasons.

But even here the forces of *actual* competition, *potential* competition, and *substitution*, and what K. W. Rothschild (*Economic Journal*, September 1947) well described as the *motive of long-run security*, do ensure that value will react through time to changes in conditions of demand and cost in the same direction as they would under the general assumptions of the competitive analysis, though doubtless not to the same degree.

Here I would remind you of a statement of Marshall in the Address which he gave in 1890 (the year of publication of the *Principles*) when he was President of Section F of the British Association. It was called " Some Aspects of Competition " and incorporated the results of a very intensive study of the American trust movement.

" The growth of combinations and partial monopolies has in many ways increased, and in no way diminished, the practical importance of the careful study of the influences which the normal forces of competition exert on normal value ". This is a very categorical statement, and we can be certain that it was a deeply considered and pondered expression of opinion. Even today there is surely a great deal of truth in this.

The only absolute monopolies, where there is *no* freedom of entry, are State monopolies and it is only here that the Marshallian concept of normal value might be said to be largely inapplicable. Even so I would remind you that to take the extreme case of Soviet Russia, the whole system of pricing output is based on labour cost of production plus a planned profit, which forms part of the price ; and though the allocation of resources is, of course, very different from what it would be under a system of free enterprise, the relative accounting prices (apart from turnover tax) of the things which *are* produced are determined by their relative costs of production, which in turn are influenced by the scale of output, etc.

It is for me a very interesting fact that the one important difference I have been able to discover between the Marshall of the early (1879) *Economics of Industry* and the Marshall of the *Principles*, is that whereas in the

Economics of Industry he defined *normal* results as "those which competition would bring about in the long run", in the *Principles* he speaks of the mistaken notion "that economic results are normal which are due to the undisturbed effects of free competition. But the term has often to be applied to conditions in which perfectly free competition does not exist and can hardly even be supposed to exist." Elsewhere he says: "Of course normal does not mean competitive". Light is thrown on this by his letter to J. B. Clark, written in 1902; after saying that his time analysis of value had not altered since 1870, he went on:

"But of course in other directions I have changed much. I then believed it was possible to have a coherent though abstract doctrine of economics in which competition was the only dominant force; and I then defined 'normal' as that which the undisturbed play of competition would bring about: and now I regard that position as untenable from an abstract as well as from a practical point of view".

What I would suggest is that except in those relatively few cases where there is a *high* degree of restriction of entry and demand is very inelastic, the notion of normal value in Marshall's sense (and the analysis that lies behind it) has a large measure of applicability—in other words it has considerable relevance for a large part, probably the greater part, of the field of imperfect competition—especially if, as I believe we ought to do, we think of normal profit as meaning simply that rate of profit, whatever it is, which will result in that industry neither expanding nor contracting in relation to other industries *as a whole.* It must also be remembered that, even under perfect competition, there is no reason to suppose that the normal profit on capital will be the same in different industries, since it will vary with risk and with the difficulty and burdensomeness of the work of management. Finally, it may be added that, particularly in the case of imperfect competition, and with multi-product firms, the notion of a normal rate of profit on the turnover may have more influence on pricing policy than that of a normal rate of profit on total capital.

Hitherto, I have merely been treating Marshall as the embodiment, the apotheosis, of the classical theory value. I turn now to consider, all too briefly, what is his own major claim to fame, in value theory—his time analysis, his famous triple classification of value in the market, in the short period and in the long period.

The importance of this distinction lies almost wholly on the side of supply—the only general statement that I suppose could be made on the side of demand is that, other things being equal, the longer the period under consideration the more elastic is the demand curve likely to be.

Let us examine this triple classification :

In the case of the market we are dealing with a *stock* of goods that are already in existence and which are the fruits of past production.

In the case of the short period we are dealing with a *flow* of output from a substantially fixed *stock* of specialised instruments of production.

In the case of the long period we are dealing with a *flow* of output from a *flow* of all the factors of production that are required to produce that output.

In all these cases the essential distinction turns on what Opie (*Economic Journal* for June 1931) has so usefully christened "operational time". In the market, by *definition*, the stock of goods already produced cannot be added to from production—it is a fixed quantum.

The short period is *defined* as any period of time too short to allow the stock of specialised capital and skill to alter appreciably as a result of changes in the earnings of these factors.

The long period is *defined* as any period of time which is long enough to allow the level of earnings of the specialised factors to influence appreciably their supply.

Each period is thus defined and characterised in terms of the operations which are permitted or not permitted to take place in it—this permission being determined by the amount of time required to effect these operations.

Hence long and short periods will vary in duration in clock time, from one industry to another, and for the same industry may be quite different for a contraction than for an expansion.

Now in the market, since the goods available to be bought are already in existence, and their costs have already been incurred, their market values will be determined by the demand for the available supply; and there is in the market therefore no necessary connection between what it cost to produce these things and their actual value or price. Here the emphasis is on the word *necessary*. In actual practice (apart from periods of rapid inflation or deflation) the market prices of most goods sold at retail fluctuate little in the short period and are presumably pretty close to their normal cost of production, and the same is true of the market prices of a large part of output other than that of raw materials. One general reason for this is that most of the goods already on the market would not have been produced if their producers had not thought that the prices they would get would cover their costs. Their actual supply on the market is the result of calculations which *did* take full cost into account. Hence, unless there has been a marked change in demand (or cost) one would not expect there to be a *wide* divergence between price and cost.

Nevertheless it is still true that market price could be anything between zero and some extremely high figure.

In the short period there is a variable flow of output from a substantially fixed stock of specialised equipment—both the number and the size of firms being by definition a constant. But the output is variable within a considerable range up or down, depending on the intensity with which the fixed stock of equipment is operated. Under these circumstances *average* prime cost tends to put a floor or lower limit on price, while the upper limit depends upon the elasticity of the short-period supply curve (which is, of course, the curve of *marginal* prime costs) up to the phase when this becomes a vertical straight line, i.e. has a zero elasticity ; after that there is no theoretical limit to the possible rise in price in the short period. With regard to the lower limit of average prime cost, Marshall pointed out repeatedly that even when an industry was depressed, the fear of spoiling the market (a concept which would seem to assume some measure of imperfection of the market) would usually prevent prices from being pushed down as low as this.

It is in relation to the short period that the doctrine of quasi-rent comes into the picture.

Very broadly stated, quasi-rent is the excess if any of the aggregate receipts from an instrument of production made by man, say, a machine, over the aggregate prime costs, including wear and tear, of working that machine.

Readers of Marshall will remember that he lays it down as a fundamental proposition that all rents are differential rents and all rents are scarcity rents.

Quasi-rent can be expressed *differentially* in two ways. (1) It is the difference between total receipts and total prime costs in respect of the working of any given machine; (2) it is the difference between the net income of a machine which *is* earning a surplus above prime cost, and the earnings of a machine which is marginal in the sense that it only earns just enough to cover its own (presumably) higher prime costs of working—the net income in the latter case being zero. But the theory does not of course *depend* upon there being any machines which are marginal in this sense, any more than the theory of rent depends on there being any no-rent land at the margin of cultivation. Quasi-rent, however, is most emphatically *not* differential in the sense of being necessarily either larger or smaller than normal profits. This misinterpretation of Marshall's doctrine of quasi-rent, which is one of the most common, probably arises from a misunderstanding of his insistence that, in a world of largely unforeseeable change and movement, the net income derived from any given investment in the short period is liable, indeed likely, to diverge from that which would represent a normal profit on the investment. But quasi-rent itself is not defined *in terms* of that divergence: it is the whole of the net income from the investment, irrespective of whether it is greater than, equal to, or less than a normal profit. It could be zero, but could never be negative. When Marshall wishes to contrast quasi-rent with normal profits, he speaks of a high or a low quasi-rent, meaning a quasi-rent that is in excess of or below normal profits.

While quasi-rent can be expressed and measured differentially it arises fundamentally from *scarcity*. The supply of appliances of production made by man being fixed (by definition) in the short period, the net income (or quasi-rent) derived from them partakes of the nature of rent, and is therefore price-determined and not price-determining, in Marshall's sense of the term. In other words it behaves like a rent. If a tax is imposed on a quasi-rent in the short period, it falls on a surplus and not at the margin, and cannot be shifted. It is borne by the recipient *during the short period.*

So far I have been speaking of a machine. It is more difficult when one comes to a whole business.

There seem to be two alternatives: either, like Ragnar Frisch in his admirable article in the *Quarterly Journal of*

Economics for November 1950, we can distinguish in effect between gross and net quasi-rents, *gross* quasi-rents being the whole excess of receipts over prime costs narrowly conceived, while *net* quasi-rents correspond to *gross profits* (interest on capital and earnings of management), deduction having been made of all other supplementary costs ; or (as I think Marshall would have preferred) we can expand the scope of prime costs to include all those costs (salaries, rates, etc.) which have to be met and paid out, if the business as a whole is to keep running for any considerable length of time. These are in effect the costs that would be saved if the business closed down.

Now the relation between quasi-rent and normal profit is that that income which, regarded from the short period, is a quasi-rent—a surplus above total prime cost, an unnecessary income in the sense that production would still continue even though its amount were reduced or disappeared—that income looked at from the long-period point of view is a profit, and as such is a part of long-period marginal cost of production, and becomes price-determining.

In the short period only prime costs are truly marginal, since if they are not covered the output in question will cease to be produced. In the long period supplementary costs, including interest and earnings of management, must be covered if any *given* output is to go on being produced—and of course in the long period the distinction between prime and supplementary costs vanishes, for all costs are avoidable before you incur them.

A man will not make an investment unless he considers that his anticipated quasi-rents will cover his *total* costs ; but once he has made it and sunk his capital in some specific form, the whole of the net income that he derives from it thereafter is a quasi-rent, price-determined and not price-determining, the size of the quasi-rent being governed by the commercial environment—to use a Marshallian phrase.

Continuing now with the long period it is very important to realise that Marshall uses the term in two quite different senses, as a rule without any specific explanation, but leaving the context to explain his meaning.

In the first sense the long period is any period the duration of which is longer than the short period, i.e. any period in which time *is* allowed for the earnings of the instruments of production made by man to react *substantially* upon their supply. Thus to take the example already given, although a tax on the quasi-rents (profits) of a particular industry cannot be shifted in the short period, in the long period (in this sense of the term) it will fall more and more as time goes on upon cost of production at the margin, and will lead to a contraction of productive capacity, a decline in output and a consequent rise in price.

In the second sense, which I am accustomed to think of as *the* long period, we are dealing with that conceptual position of full long-period equilibrium which would be attained, *ceteris paribus*, if time were given for everything to work itself out, so that there is full equilibrium in respect of an output ON, the long-period marginal demand price for ON units being the same as the long-period marginal supply price of ON units—the latter being for an increasing returns industry, as I have stated earlier, the average cost per unit of output of the representative firm including a normal profit.

In practice much confusion has been caused by mixing up these two meanings of the long period. The first is clearly quite realistic, the second is purely conceptual—and there is no reason to think that it will ever be attained in the real world. But it is a necessary and indispensable tool in the whole analysis.

Reverting to the doctrine of quasi-rents: if through time the actual and anticipated quasi-rents in an industry reflecting past, present and expected future earnings, as determined by prices, would represent about normal gross profits on the investment, then the industry will maintain about its present size so long as this is the situation. If they are less than this the industry will contract and, *ceteris paribus*, prices will tend to rise. If they are more than this the industry will expand and, *ceteris paribus*, prices will tend to fall. These changes in output, and therefore in prices, will of course react correspondingly upon the quasi-rents themselves. Marshall holds that in the stationary state there would be no such thing as quasi-rents. Not of course that the earnings or net income that are regarded as a quasi-rent in the short period would disappear, but merely that that income would always *on the average* be equal to normal profits, i.e. the supply price of the factors concerned. It would always be price-determining and not price-determined, and therefore could no longer be properly styled a quasi-rent since it would have none of the attributes of a rent or surplus above cost.

It is, of course, equally true that in the long period the whole notion of quasi-rents disappears because, as has already been stated, that income which in the short period is to be regarded as a surplus above marginal cost, is for long periods a part of long-period marginal cost, since a normal profit represents the supply price of business enterprise in command over capital, needed to maintain an industry in being at its *existing* size, while quasi-rents which, through a sufficient period of time, represent more than normal profits, will lead to the expansion of the industry and its output, and conversely for quasi-rents which through time represent less than normal profits.

In one of Marshall's remarkable hitherto unpublished letters to Edgeworth, dated 26 April, 1892, after discussing quite temperately Cunynghame's successive cost curves, which he declared he did not understand, Marshall suddenly bursts out as follows:

" You have gone beyond Cunynghame. For he does use a new term; while you utterly wreck my pet phrase ' short period ', by applying it to a use which seems to me likely to introduce calamitous confusion. The changes which arise from the gradual rise and decline of fashion and familiarity, the feeling that a thing is select or that it is vulgar, of being unique like an old book or the key of a Bramah lock, or useful like screws in machinery made to Whitworth's gauge which can be easily replaced if lost, these things have nothing in common with the distinction between ' short ' and ' long ' period supply prices in my own pet and peculiar use of the term. For they represent casual influences, and it corresponds to a great fundamental difference, common to all branches of work; that namely between periods which are not and those which are long enough to allow the supply of the agents of production (workers, material plant, specialisation of skill and machinery, business organisation and connection) to be adapted to the demand: for the one [*sc.* long-period] supply price=total cost of production at the margin. For the other [*sc.* short-period] it means prime cost mitigated by a fear of spoiling the market. Prime cost itself, being made up in a great measure of quasi-rents. As the parent of this specialised term, I cannot refrain when I see you plunging it into a medium in which it cannot breathe, from calling *MURDER!*"

I would like to comment on one striking sentence in the foregoing extract: "Prime cost itself being made up in a great measure of quasi-rents".

At first sight it might seem as though this was in flat contradiction to the whole of Marshall's own doctrine of quasi-rent. But this is in fact not the case; for the prime costs to which he is here referring are of course not being regarded as quasi-rents from the point of view of the actual business. What Marshall is saying is that the incomes of the owners of the factors of production (labour and capital), which for the business represent prime costs (and which are reflected in the prices paid by the business for its labour, raw materials, etc.), being themselves determined by the action of short-period forces are liable at any given moment to diverge from what would be their normal long-period values, and therefore can be regarded as quasi-rents from the point of view of their recipients—i.e. of those to whom these prime costs are paid out. This interpretation would be perfectly consistent with the way in which, especially in the earlier editions of the *Principles*, Marshall used the term quasi-rent when he came to Book VI (Distribution).

Finally, and it is a very important point, market, short-period, and long-period forces must be thought of as all working simultaneously the whole of the time. This can perhaps be most clearly seen in the case of long-period forces. At any moment of time it is likely that some capital equipment in any given industry has come to the end of its useful life and reached the stage when it ought to be replaced. The decision whether or not to replace is usually, though not always, a long-period decision—not always, because a firm which is earning less than normal profits and may not even be covering all its prime costs, in the extended sense of the term, may still prefer to replace some essential part of its equipment (e.g. a prime mover) rather than close down altogether at that juncture.

It is also true that at any moment of time there is some *entrepreneur* in command over capital who is looking for a profitable investment, and has a wide choice open to him. A decision to invest in a particular industry, or to expand the productive equipment of a given firm, is again a long-period decision. But these long-period decisions, though they are going on all the time, have no immediate effect because individually they are too small in relation to the aggregate of investment in an industry to be significant, and of course a good deal of time must elapse between the decision to build a factory and when it is built and in production.

When enough time has been given for a series of such decisions, based on long-period consideration, to have effect—we have moved out of the Marshallian short period into the long period—*not* into long-period equilibrium—for that would be *the* long period—but in the direction of what would be equilibrium if the forces remained constant for a sufficiently long period of time, all other things being equal.

This, as I understand it, is Marshall's theory of normal value in the framework of his time analysis, and of the basic assumptions of his system, and I would submit that there is nothing in contemporary economic thought which has rendered it obsolete.

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The Effects of Income-Redistribution on Aggregate Consumption with Interdependence of Consumers' Preferences

By Harry G. Johnson

This article is concerned with the effects of income-redistribution on the aggregate propensity to consume, in a society in which individual consumption is assumed to depend not only on the individual's income but also on the consumption of other individuals in the community. While interdependence of consumers' preferences has received increasing attention in recent years, with consequent modifications of accepted theoretical conclusions, its implications for the theory of income-redistribution have not so far been adequately investigated.[1] The purpose of this article is to show that a number of interesting possibilities emerge when it is assumed that consumer preferences are interdependent.

The analysis which follows is divided into two parts. Section I below deals with the general case of income-redistribution in an n-person community; Section II illustrates the conclusions by reference to a community of three persons, who may be taken to represent social classes. Since the analysis of the first section is rather mathematical, readers interested in the conclusions rather than the methods of arriving at them may prefer to omit this section and proceed directly to Section II.

To simplify the problem, we make the following assumptions:

1. That all prices and interest rates are constant, so that aggregate consumption depends (ultimately) only on aggregate income and its distribution.

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[1] Professor James S. Duesenberry's remarks on the subject (*Income, Saving and the Theory of Consumer Behavior*, 1949, pp. 44-5) have been shown by Mr. Ralph Turvey (*Economica*, New Series, Vol. XVII, No. 68, 1951, pp. 451-4) and the writer (ibid., Vol. XVIII, No. 71, 1950, pp. 295-7) to be open to serious objections.

2. That each individual's total consumption expenditure depends only on his income and the total consumption expenditures of all other individuals ; in short, we ignore the distribution of consumption expenditure among different kinds of consumer goods. To be realistic, the interdependence of consumption would have to be assumed to apply to each good separately, and probably also to vary according to the nature of the good ; but the present simplification seems justified for macro-economic analysis.
3. That redistribution of income does not go far enough to alter the relative positions of individuals in the income-scale ; this assumption permits us to identify particular individuals with particular social classes.
4. That the relations between individual consumption and individual income and other individuals' consumption can be approximated by a linear function, either because the relation is in fact roughly linear or because we confine ourselves to the consideration of changes small enough to permit this assumption.

We also assume that the marginal propensity to consume of each individual is positive, and is lower the higher the individual income.

I

Assumptions 1 and 2 permit us to describe the consumption habits of a community of n individuals with interdependent preferences by a system of n equations of the form

$$C_i = F_i\,(Y_i, C_1 \ldots C_j \ldots C_n)\ (i \neq j,\ i = 1 \ldots n).$$

Assumption 3 permits us to interpret these equations in terms of the attitudes of social classes to one another (see below).

On assumption 4, these equations can be differentiated to show the effects of changes in the independent variables, giving n equations

$$dC_i = F_{iy}\, dY_i + \sum_{j \neq i} F_{ij}\, dC_j$$

in which $F_{iy}=\dfrac{\partial F_i}{\partial Y_i}$ and $F_{ij}=\dfrac{\partial F_i}{\partial C_j}$.

These equations can be re-arranged and translated into matrix notation, giving the result

$$[I-F_{ij}]\ \{dC_i\}=\{F_{iy}\ dY_i\}$$

in which [ ] denotes a matrix and { } a column vector, and I stands for the unit matrix. This expression in turn can be re-arranged to give the changes in consumption as functions of changes in individual incomes, i.e.

$$\{dC_i\}=[I-F_{ij}]^{-1}\ \{F_{iy}\ dY_i\}\quad .$$

This expression bears a close formal similarity to the Goodwin matrix multiplier.[1] Indeed, since $F_{iy}\ dY_i$ represents the change in the consumption of the i'th individual that would occur if his income changed while everyone else's consumption remained constant, or alternatively the change that would occur if there were no interdependence of consumption, the term $[I-F_{ij}]^{-1}$ may be regarded as a matrix multiplier relating the changes in individual consumption resulting from changes in individual incomes under conditions of interdependent preferences to the changes that would take place in the absence of interdependence.[2]

Before proceeding further, it is necessary to look briefly at the stability conditions required to ensure that, in a dynamic treatment of the problem, the changes in consumption resulting from changes in individual incomes would actually converge on the values indicated by the static matrix multiplier. It can be shown[3] that a sufficient condition for stability is that the coefficients of dependence of one individual's consumption on another's be all of the same sign and the absolute value of the sum of the coefficients for each individual's consumption should be less than unity ; in mathematical terms,

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[1] R. M. Goodwin, " The Multiplier as Matrix ", *Economic Journal*, Vol. LIX, No. 236 (December, 1949), pp. 537-555.

[2] It should be noticed that if individual consumption expenditures were independent of each other instead of interdependent, i.e. if $F_{ij}\equiv 0$, the whole expression would reduce to

$$\{\ dC_i\ \}=\{\ F_{iy}\,dY_i\ \}\ ;$$

changes in individual consumption would depend only on changes in individual incomes and on the individual marginal propensities to consume. In this case, the effects of income distribution on aggregate consumption would depend only on differences between the marginal propensities to consume of the various individuals, and on the extent of redistribution, as in the usual analysis.

[3] By analogy with the proof outlined, although incorrectly, in Goodwin, *op. cit.*, p. 547.

$$\left|\sum_{j=1}^{n} F_{ij}\right| < 1 \qquad (i, j = 1 \ldots n, i \neq j).$$

Economically, this would mean that if the consumption of all other individuals than the *i*'th individual were to change in the same direction by one unit, the *i*'th individual's income remaining unchanged, the *i*'th individual would change his consumption by less than one unit. (If this actually happened, of course, there would be further repercussions on the consumption of the other *j* individuals, and back on the consumption of the *i*'th individual; but this characteristic of the individual consumption functions would be sufficient to guarantee stability.) It seems reasonable to assume that the individual consumption functions are of this type, and the remainder of the argument will be conducted on this assumption.

So far, the signs of the F_{ij} have not been specified; they may be either positive, indicating that a rise in *j*'s consumption leads to an increase of *i*'s consumption, or negative, indicating that a rise in *j*'s consumption leads to a fall in *i*'s consumption. The case in which all the F_{ij}'s are negative would correspond to a community of saints in which each feels better off when others consume more, and so consumes less himself from any given income. Alternatively it could describe a nation of optimistic spongers, or possibly a society of snobs. This case is so unrealistic as not to be worth further investigation. The case in which all the F_{ij}'s are positive corresponds to a competitive or emulative society (see below for definition of terms) in which each individual is led to consume more from a given income by a rise in everyone else's consumption. This is the case with which we shall be concerned.

The total change in consumption consequent on changes in individual incomes is

$$\sum_{i=1}^{n} dC_i = \sum_{i=1}^{n} [I - F_{ij}]^{-1} \{F_{iy} dY_i\}$$

or, in determinantal notation,

$$\sum_{i=1}^{n} \sum_{j=1}^{n} \frac{\Delta_{ji} F_{jy} dY_j}{\Delta}$$

where $\triangle$ stands for the determinant

$$\begin{vmatrix} 1 & -F_{12} & -F_{13} & \cdots\cdots & -F_{1n} \\ -F_{21} & 1 & -F_{23} & \cdots\cdots & -F_{2n} \\ -F_{31} & -F_{32} & 1 & \cdots\cdots & -F_{3n} \\ \cdot & \cdot & \cdot & \cdots\cdots & \cdot \\ \cdot & \cdot & \cdot & \cdots\cdots & \cdot \\ \cdot & \cdot & \cdot & \cdots\cdots & \cdot \\ -F_{n1} & -F_{n2} & -F_{n3} & \cdots\cdots & 1 \end{vmatrix}$$

and $\triangle_{ij}$ is the co-factor of the element in the *i*'th row and *j*'th column. This can be re-arranged in the form

$$dC = \sum_{i=1}^{n} \sum_{j=1}^{n} \frac{\triangle_{ij}}{\triangle} F_{iy} \, dY_i \, .$$

The *i*'th term in this summation represents the effect on the total consumption of the community of an increase in the income of the *i*'th individual, so that

$$\frac{\partial C}{\partial Y_i} = \sum_{j=1}^{n} \frac{\triangle_{ij}}{\triangle} F_{iy} \, .$$

The effect of this re-arrangement is to make the total change in the community's consumption a sum of separate multiples of the changes in individual incomes.

It can be proved that the coefficient of F_{iy} in the expression for $\frac{\partial C}{\partial Y_i}$ above is positive and greater than unity for all i: that is,

$$\sum_{j=1}^{n} \frac{\triangle_{ij}}{\triangle} > 1 \quad (i = 1 \, . \, . \, . \, . \, . \, n).$$

This property can be inferred from the assumption of stability made above, but an alternative proof of it is presented here.

This proof requires prior proof that the co-factors of all the elements in the determinant $\triangle$ are positive. An inductive proof of the latter, suggested by Mr. N. A. Routledge of King's College, Cambridge, is set out in the next four paragraphs.

We want to show that, in a determinant in which the diagonal elements are unity, the off-diagonal elements uniformly negative, and the row-sums of elements positive, all the co-factors will be positive. We prove this by induction on the size of the determinant. It is clearly true for a two-by-two determinant, for the matrix of co-factors is $\begin{bmatrix} 1 & F_{21} \\ F_{12} & 1 \end{bmatrix}$, all of whose elements are clearly positive. Now assume that it is true for all determinants (of the given form) of size $(n-1)$-by-$(n-1)$.

We begin by proving that if the co-factors are all positive, the determinant itself is positive. To do so, we add all other columns to the first column of the determinant, and expand the resulting determinant (which will have the same value as the original) in terms of its first column. This gives the value of the determinant as the sum of the products of each row-sum with the co-factor of its first-column element, that is,

$$\triangle = \sum_{i=1}^{n} \left(1 - \sum_{j=1}^{n} F_{ij} \right) \triangle_{i1}$$

Since the row-sums are positive by the form of the determinant, and the co-factors positive by assumption, the determinant itself is positive.

Now consider the n-by-n determinant $\triangle$ and its co-factors $\triangle_{ij}$. The co-factors $\triangle_{ii}$ of its diagonal elements will be $(n-1)$-by-$(n-1)$ determinants of the given form, and will, on the proof given in the preceding paragraph, be positive if the co-factors of the $(n-1)$-by-$(n-1)$ determinant are all positive. The co-factor $\triangle_{ij}$ $(i \neq j)$ of any off-diagonal element is by definition equal to its minor, multiplied by $(-1)^{i-j}$. The minor of any such element can be transformed, by the $|i-j|-1$ interchanges of columns and corresponding number of changes of sign necessary to bring the i'th column to the position between the initial $(j-1)$'th and j'th columns, into an $(n-1)$-by-$(n-1)$ determinant of form identical with the given form, except that one of the diagonal elements will be replaced by a negative element. The column containing this element will therefore consist only of negative elements: furthermore, since the determinant is otherwise of the same form as the given one, the co-factors of elements in this column will be positive by our initial assumption. By expanding the determinant down this column, it can easily be shown that the determinant is negative. Since the co-factor $\triangle_{ij}$ in the n-by-n determinant is equal to this $(n-1)$-by-$(n-1)$ determinant multiplied by $(-1)^{i-j} \cdot (-1)^{|i-j|-1} = -1$, it will be positive.

We have therefore shown that, if the co-factors of an $(n-1)$-by-$(n-1)$ determinant of the given form are positive, the co-factors of an n-by-n determinant of the same form will be positive. Since the co-factors of a two-by-two determinant of this form are all positive it follows that the co-factors of a determinant of the same form of any higher order are all positive.

It also follows that $\sum_{j=1}^{n} \frac{\Delta_{ij}}{\Delta}$ is positive and greater than unity. We have already proved that all the co-factors and the determinant are positive. Expanding the determinant along the i'th row,

$$\Delta = \Delta_{ii} - \sum_{j=1}^{n} F_{ij} \Delta_{ij}$$

which is obviously less than $\sum_{j=1}^{n} \Delta_{ij}$ so that $\sum_{j=1}^{n} \frac{\Delta_{ij}}{\Delta} > 1$.

This result is of central importance for the subsequent argument.[1]

The effect of income-redistribution on total consumption from a given income is given by the formula

$$dC = \sum_{i=1}^{n} \sum_{j=1}^{n} \frac{\Delta_{ij}}{\Delta} F_{ij}\, dY_i$$

in the special case in which $\sum_{i=1}^{n} dY_i = 0$ and the individual dY_i's are determined by the amount of income re-distributed and the rule according to which it is redistributed. Given this rule, the effect on total consumption will be a function of the amount redistributed, and will depend both on the individual marginal propensities to consume (as in the usual analysis) and on the coefficients F_{ij}.

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[1] From this result it may be inferred that an increase in all individual incomes will necessarily lead to an increase in the consumption of all individuals, and so in total consumption; also that the increase in total consumption will be greater in this case than it would be in the absence of interdependence.

It can also be shown that the effect of an increase in one individual's income will be to increase his own consumption by more than it increases the consumption of any other individual in the community. The effect of an increase dY_i in the i'th individual's income on the consumption of any individual j is $\frac{\Delta_{ij}}{\Delta} F_{ij}\, dY_i$: and it can be proved that $\Delta_{ii} > \Delta_{ij}$. By interchanging columns in the way outlined in the text and making the appropriate changes of sign, Δ_{ij} can be transformed into a determinant identical with Δ_{ii} except that the column in it corresponding to the j'th column of Δ will contain the elements $+F_{ki}$ instead of $-F_{kj}$ and 1 $(k \neq i)$. Consequently $\Delta_{ii} - \Delta_{ij}$ will be a determinant identical with Δ_{ii} except for one column; adding all the other columns to this one makes each element in this column equal to the corresponding row-sum of Δ ; and expansion of the determinant down this column (the co-factors of whose elements have been proved to be positive) shows $\Delta_{ii} - \Delta_{ij}$ to be necessarily positive, i.e. $\Delta_{ii} > \Delta_{ij}$. This result is, of course, intuitively obvious from the fact that $\Delta = \Delta_{ii} - \sum_{j=1}^{n} \Delta_{ij} F_{ij} > 0$ and that any individual F_{ij} can approach unity as a limit.

Since all rules for redistributing income can be reduced to combinations of transfers of income between two individuals, the general problem can be approached in terms of the effect of a transfer of one unit of income from the j'th to the i'th individual. The effect of such a transfer on total consumption is

$$\sum_{j=1}^{n} \frac{\Delta_{ij}}{\Delta} F_{iy} - \sum_{i=1}^{n} \frac{\Delta_{ji}}{\Delta} F_{jy};$$

for simplicity, we define

$$D_i = \sum_{j=1}^{n} \frac{\Delta_{ij}}{\Delta} \text{ and } \mathrm{F}_i = \mathrm{F}_{iy},$$

so that this may be re-written as

$$D_iF_i - D_jF_j.$$

For further analysis, we may distinguish between the "income effect" and the "interdependence effect" of the redistribution. The "income effect" is defined as the change in total consumption that would result from a transfer of one unit of income from j to i in the absence of interdependence; it is equal to $F_i - F_j$, and would on our assumptions be positive for a redistribution of income from richer to poorer, and negative for a redistribution from poorer to richer. The "interdependence effect" is defined as the effect on total consumption of an initial increase of one unit in i's consumption and decrease of one unit in j's consumption; it is equal to $D_i - D_j$.

The total effect of a unit redistribution of income from j to i is $D_iF_i - D_jF_j = D_i(F_i - F_j) + F_j(D_i - D_j) = (F_i - F_j)\left(D_i + F_j\frac{(D_i - D_j)}{(F_i - F_j)}\right)$. Remembering that $D_i > 1$, it is obvious that the total effect will be in the same direction as, and in absolute amount larger than, the "income effect", so long as $(D_i - D_j)$ and $(F_i - F_j)$ are of the same sign—that is, so long as the "income effect" and the "interdependence effect" are both either positive or negative; in this case, the total effect may even be greater than the amount of the transfer of income which brings it about. If the " interdependence effect " is of opposite sign to the " income effect ", the total effect may be in the same direction as and absolutely larger than the " income effect " ; or it may be in the same direction but smaller in absolute terms ; or it may be in the opposite direction.

For the total effect to be in the same direction as, and greater than, the " income effect ", it is necessary that

$$D_i + F_j \frac{(D_i - D_j)}{(F_i - F_j)} > 1.$$

This requires, for $(F_i - F_j) > 0$ (positive " income effect ") that

$$D_i F_i - D_j F_j - (F_i - F_j) > 0$$

or

$$\frac{F_i (D_i - 1)}{F_j (D_j - 1)} > 1$$

which is automatically true if $D_i > D_j$ (positive " interdependence effect ") and *may* still be true if $D_i < D_j$ (negative " interdependence effect "). For $(F_i - F_j) < 0$ (negative " income effect ") it requires

$$D_i F_i - D_j F_j - (F_i - F_j) < 0$$

or

$$\frac{F_i (D_i - 1)}{F_j (D_j - 1)} < 1.$$

which is automatically true for $D_i < D_j$ (negative " interdependence effect ") and *may* still be true for $D_i > D_j$ (positive " interdependence effect ").

For the total effect to be in the opposite direction to the " income effect " it is necessary that

$$D_i + F_j \frac{(D_i - D_j)}{(F_i - F_j)} < 0.$$

For $(F_i - F_j) > 0$ this requires $\frac{D_i}{D_j} < \frac{F_j}{F_i}$; for $(F_i - F_j) < 0$, $\frac{D_i}{D_j} > \frac{F_j}{F_i}$.

To summarize, if the " income effect " and the " interdependence effect " are of the same sign, the total effect of a redistribution of income will be in the same direction as, and larger in absolute magnitude than, the " income effect ". If they are of opposite signs, various results are possible ; these are assembled in the following table.

The total effect will be	If the " income effect " is positive and	OR	If the " income effect " is negative and
In the same direction as the " income effect " and larger	$\frac{(D_i - 1)}{(D_j - 1)} > \frac{F_j}{F_i}$		$\frac{(D_i - 1)}{(D_j - 1)} < \frac{F_j}{F_i}$
In the same direction as the " income effect " but smaller	$\frac{D_j}{D_i} < \frac{F_i}{F_j} < \frac{D_j - 1}{D_i - 1}$		$\frac{D_j}{D_i} > \frac{F_i}{F_j} > \frac{D_j - 1}{D_i - 1}$
In the opposite direction to the " income effect "	$\frac{D_i}{D_j} < \frac{F_j}{F_i}$		$\frac{D_i}{D_j} > \frac{F_j}{F_i}$

In order to carry the analysis further than this, we must be able to determine at least the sign of the " interdependence effect " for any particular transfer of income between two individuals. (Our assumption that the marginal propensity to consume varies inversely with income already permits us to determine the sign of the " income effect ".) To do so, we must be able to rank the individuals in the community according to the influence their consumption has on total consumption (i.e., we must be able to order the D_i's).

There are two possible ways of attempting to arrive at such a ranking, the psychological and the sociological. A knowledge of the psychology of the individual members of the community would permit an ordering of the relative magnitudes of the influence on each individual's consumption of the consumption of the other individuals, and also of the relative magnitudes of the influences of any two individuals' consumption on each other. However, this approach would lead only to a partial ordering of the elements in the matrix F_{ij}, from which it would be no easy matter to infer the relative influences on total consumption of each individual's consumption. A much simpler and more reliable way would be to approach the problem of ranking the influence of each individual's consumption on total consumption directly, through a knowledge of the sociology of the community. We shall therefore assume that our rankings are sociologically derived ; this eliminates a great deal of difficulty, at the expense of preventing us from interpreting the rankings, except in a very loose way, in terms of the social psychology of the community.

To begin with, we may distinguish two possible very simple cases. In the first, which we shall designate as a " competitive society ", the individual's influence on everyone else's consumption varies inversely with his position in the income scale ; this might be the case (loosely speaking) in a society in which everyone was concerned with keeping ahead of those further down the income-scale than himself. In such a society, the " interdependence effect " of any redistribution of income would always have the same sign as the " income effect ", so that the total change in consumption would always be in the same direction as and larger in absolute amount than the change that would have occurred in the absence of interdependence of consumption. In contrast to this is the case, which we shall designate as an " emulative society ", in which the individual's influence on everyone else's consumption varies directly with his position in the income scale ; this might be the case (again loosely speaking) in a society in which everyone was trying to catch up with those higher in the income scale than himself. In such a society the " interdependence effect " and the " income effect " of any redistribution of income would always be of opposite sign, so that the total effect of any redistribution might be in the same direction as and larger than, in the same direction as but smaller than, or in the opposite direction to, the change that would have occurred in the absence of interdependence.

Both of the cases are extremely unrealistic, however, because in any actual society the influence of an individual's consumption on the consumption of the others is not likely to be correlated exactly with income. Interdependence of consumption is likely to be either a matter of contact with the consumption habits of others, or of comparison of one's own consumption habits with an ideal standard identified in practice with the consumption habits of a social class about whom there is a relatively great amount of social information (through magazines, films, advertisements, novels, etc.). In either case, it is likely that those somewhere near the middle of the income-scale will have the most influence on social consumption. In this case, individual influence on social consumption might be positively correlated with income in the lower half of the income-range, and negatively correlated with income in the upper half of the income range. Such a situation might give rise to a number of interesting possibilities—for example that redistribution from rich to middle-class would raise consumption by more than redistribution from middle-class to poor, or even than redistribution from rich to poor.

II

Further analysis of the n-individual case would require a more elaborate specification of the D_i's and F_i's than could be readily summarized in a few simple and economically comprehensible statements. We shall therefore abandon the general case, and proceed to illustrate what has already been said by reference to a simple three-person model in which the individuals can, if desired, be taken to represent social classes. This model has the advantage of enabling us to deduce our results from psychological rather than sociological criteria of consumption behaviour.

The consumption behaviour of this three-person community is described by three equations :

$$\begin{aligned} C_1 &= F_1\ (Y_1,\ C_2,\ C_3) \\ C_2 &= F_2\ (Y_1,\ C_1,\ C_3) \\ C_3 &= F_3\ (Y_3,\ C_1,\ C_2). \end{aligned}$$

1, 2 and 3 are respectively poor, middle-class and rich. Differentiating these equations, we get

$$\begin{bmatrix} 1 & -F_{12} & -F_{13} \\ -F_{21} & 1 & -F_{23} \\ -F_{31} & -F_{32} & 1 \end{bmatrix} \begin{Bmatrix} dC_1 \\ dC_2 \\ dC_3 \end{Bmatrix} = \begin{Bmatrix} F_{1y}\ dY_1 \\ F_{2y}\ dY_2 \\ F_{3y}\ dY_3 \end{Bmatrix}$$

from which we obtain

$$\begin{aligned} dC = \frac{1}{\triangle} & (1 - F_{32}F_{23} + F_{21} + F_{23}F_{31} + F_{21}F_{32} + F_{31})\, F_{1y}\, dY_1 \\ + \frac{1}{\triangle} & (1 - F_{31}F_{13} + F_{12} + F_{13}F_{32} + F_{12}F_{31} + F_{32})\, F_{2y}\, dY_2 \\ + \frac{1}{\triangle} & (1 - F_{12}F_{21} + F_{23} + F_{12}F_{23} + F_{21}F_{13} + F_{13})\, F_{3y}\, dY_3 \end{aligned}$$

where $\triangle = 1 - F_{12}F_{23}F_{31} - F_{13}F_{21}F_{32} - F_{13}F_{31} - F_{12}F_{21} - F_{23}F_{32}$.

It may be verified in passing that $\sum_{j=1}^{3} \frac{\triangle_{ij}}{\triangle} > 1$ for

$i = 1, 2, 3$, since the determinant is positive (as may easily be proved by substituting the limiting values $\sum_{j=1}^{3} F_{ij} = 1$ in the expression for it, which shows that it approaches zero as a limit) and it is obvious that $\sum_{j=1}^{3} \triangle_{ij} > \triangle$ for all i.

We may now consider the effects of income redistribution on total consumption. Even in this simple model, there are ten possible types of redistribution, five in each direction, corresponding to the possible groupings of the three individuals (3,2 ; 3,1 ; 2,1 ; 3, 2 and 1 ; 3 and 2, 1). The last two groupings, however, are merely combinations of the first three.

As we have already seen, the relation between the total effect of a redistribution between two individuals and the " income effect " of such a redistribution depends partly on the sign of the " interdependence effect ". For all such redistributions, it can easily be shown that the " interdependence effect " is equal to

$$\frac{1}{\triangle}\left[(F_{ng} - F_{nl})\ (1 + F_{ln} + F_{gn} - F_{gl}) + (F_{lg} - F_{gl})\ (1 + F_{nl})\right]$$

where the subscripts g, l, and n stand respectively for the gainer, the loser, and the person unaffected by the income transfer. Since $\triangle$ is positive, and all the F_{ij}'s are positive and less than unity, the sign of the " interdependence effect " is positive if $F_{ng} > F_{nl}$ and $F_{lg} > F_{gl}$, and negative if $F_{ng} < F_{nl}$ and $F_{lg} < F_{gl}$. That is, it is positive if the consumption of the individual whose income is unchanged is more affected by the consumption of the gainer than by the consumption of the loser, and if the consumption of the loser is more affected by the consumption of the gainer than the consumption of the gainer is affected by the consumption of the loser. The " interdependence effect " is negative if the reverse of these two conditions holds. Which of the two alternative pairs of conditions holds will in turn depend on the type and direction of the transfer, and the social psychology of the community.

We may conveniently divide interdependence of preferences which leads an individual to increase his consumption when others increase theirs, into two types, corresponding to two basic attitudes which we may term "emulation" and "competition". "Emulation" implies that the individual's consumption is more affected by the consumption of higher-income groups than by that of lower-income groups, so that $F_{ij} \gtrless F_{ik}$ accordingly as $j \gtrless k$. "Competition" implies that the individual's consumption is more affected by the consumption of lower-income groups than by that of higher-income groups. It is also reasonable (and necessary for the ensuing argument) to postulate that "Emulation" also implies that the lower-income individual pays more attention to the consumption of the higher-income individual than the latter does to his consumption, i.e. $F_{ij} \gtrless F_{ji}$ accordingly as $i \lessgtr j$; also that "Competition" implies the reverse, i.e. $F_{ij} \gtrless F_{ji}$ accordingly as $i \gtrless j$.[1]

A "competitive" society as defined in the last paragraph implies $F_{ng} > F_{nl}$ and $F_{lg} > F_{gl}$ for any redistribution from a higher-income to a lower-income individual, and vice-versa for any redistribution from a lower-income to a higher-income individual; hence any simple redistribution will change consumption in the same direction as and by more than would be the case without interdependence of preferences. To illustrate this, consider the following set of equations:

$$\begin{array}{rrrcl} + \ dC_1 & - \cdot 2dC_2 & - \cdot 1dC_3 & = & \cdot 9\, dY_1 \\ - \cdot 3dC_1 & + \ dC_2 & - \cdot 2dC_3 & = & \cdot 7\, dY_2 \\ - \cdot 4dC_1 & - \cdot 3dC_2 & + \ dC_3 & = & \cdot 5\, dY_3 \end{array}$$

which constitute a "competitive" society on our definition. The results of simple redistributions of one unit of income from richer to poorer may be tabulated as follows:

Transfer from	*"Income effect"*	*Total effect*
3 to 2	+·2	+ ·545
3 to 1	+·4	+1·256
2 to 1	+·2	+ ·711

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[1] In "A Note on the Effect of Income Redistribution on Aggregate Consumption with Interdependent Consumer Preferences", *Economica*, New Series, Vol. XVIII, No. 71 (August, 1951), pp. 295-7, I employed the term "superiority" to describe the case now referred to as "Competition". In that note I employed the matrix

$$\begin{bmatrix} 1 & 0 & 0 \\ -F_{21} & 1 & -F_{23} \\ 0 & 0 & 1 \end{bmatrix}$$

which made the result depend only on the attitude of the middle class and led me to overlook the necessity of making assumptions about the relative magnitudes of F_{ij} and F_{ji}. Also, by dealing only with the "interdependence effect" I failed to realize that a negative "interdependence effect" is only a necessary, and not a sufficient, condition for the "Duesenberry effect" with which I was concerned.

It is clear that the total effect is in each case greater than the "income effect"; also, in this example, the effect of a redistribution from 3 to 1 is to increase total consumption by more than the amount of income transferred.

An "emulative" society as defined above implies $F_{ng} < F_{nl}$ and $F_{lg} < F_{gl}$ for redistributions from higher-income to lower-income individuals, and vice-versa for redistributions from lower-income to higher-income individuals; hence any simple redistribution might change total consumption in any of the three ways we have mentioned. To illustrate this, consider the "emulative" society defined by the following equations:

$$\begin{array}{rrrcl} +\ dC_1 & -\cdot 3dC_2 & -\cdot 4dC_3 & = & a\,dY_1 \\ -\cdot 2dC_1 & +\ dC_2 & -\cdot 3dC_3 & = & b\,dY_2 \\ -\cdot 1dC_1 & -\cdot 2dC_2 & +\ dC_3 & = & c\,dY_3 \end{array}$$

where a, b and c stand for the respective marginal propensities to consume, which we shall vary to show the different possibilities. The results in three different illustrative cases are as follows:

Case Number	Assumed values of			*Transfer from*					
				3 *to* 2		3 *to* 1		2 *to* 1	
	a	*b*	*c*	income effect	total effect	income effect	total effect	income effect	total effect
I	·95	·6	·45	+·15	+·156	+·5	+·527	+·35	+·371
II	·9	·7	·55	+·15	+·127	+·35	+·225	+·2	+·098
III	·9	·8	·7	+·1	−·0135	+·2	−·108	+·1	−·095

In Case I, the total effect is in the same direction and larger than the "income effect"; in Case II it is in the same direction but smaller; and in Case III it is in the opposite direction. It would also be possible to construct cases in which the result differed according to the type of transfer; some combinations of results would of course be impossible because the inequalities required would be inconsistent with one another.

The concepts of "competition" and "emulation" on which the foregoing conclusions are based are, unfortunately, open to an important objection, because "competition" requires that the rich be more influenced by the consumption of the poor than by that of the middle class, while "emulation" implies that the poor be more influenced by the consumption of the rich than by that of the middle class. Both of these implications might be held to contradict the general presumption that people are most affected by those closest to them in the income scale. If the definitions of "competition" and "emulation" are corrected to take account of this presumption, then the general conclusions drawn above will not be valid for two of the simple redistributions—a transfer of income between rich and middle-class under "emulation", and a transfer of income between middle-class and poor under "competition"—because the two crucial terms in the "interdependence effect" will be of opposite signs in these cases, so that the "interdependence effect" may be either positive or negative.

These results suggest that social contacts may have an important influence on the effects of the various possible redistributions of income. To investigate this, let us disregard the distinction between "competition" and "emulation", and assume for simplicity that each individual's consumption is influenced only by the consumption of the individual or individuals immediately next to him in the income scale. Then the matrix becomes

$$\begin{bmatrix} 1 & -F_{12} & 0 \\ -F_{21} & 1 & -F_{23} \\ 0 & -F_{32} & 1 \end{bmatrix}$$

and the "interdependence effects" are as follows:
for a redistribution from 3 to 2,

$$\frac{1}{\Delta}[F_{12}(1+F_{21}-F_{23})+(F_{32}-F_{23})];$$

for a redistribution from 3 to 1,

$$\frac{1}{\Delta}(F_{21}-F_{23})(1+F_{32}+F_{12});$$

for a redistribution from 2 to 1,

$$\frac{1}{\Delta}[-F_{32}(1+F_{23}-F_{21})+(F_{21}-F_{12})].$$

From this it is obvious that, provided that the coefficients of interdependence F_{ij} do not differ much one from another, the "interdependence effect" of a redistribution from 3 to 2 will be positive and greater than the "interdependence effect" of a redistribution from 3 to 1. The latter may be positive or negative; but both will be greater (in absolute terms) than the "interdependence effect" of a redistribution from 2 to 1, which will, subject to the same proviso, be negative. This suggests that the increase in consumption may be greater if income is redistributed from the rich to the middle class than if it is redistributed from either of these to the poor; but this depends on the stronger "interdependence effect" outweighing the differences between the marginal propensities to consume of the different classes. Redistribution from rich to middle class would increase aggregate consumption more than redistribution from rich to poor if

$$\frac{1+F_{12}+F_{32}}{1+F_{21}+F_{32}(F_{21}-F_{23})}>\frac{F_{1Y}}{F_{2Y}}$$

This would be the case, for example, in the community described by the set of equations

$$\begin{array}{rrrcll} +\ dC_1 & -\cdot 2dC_2 & & = & \cdot 9\, dY_1 & \\ -\cdot 2dC_1 & +\ dC_2 & -\cdot 1dC_3 & = & \cdot 8\, dY_2 & \\ & -\cdot 3dC_2 & +\ dC_3 & = & a\, dY_3 & (a<\cdot 8) \end{array}$$

The foregoing analysis doubtless seems unrealistic and rather mechanical. Nevertheless, it has some point, because previous discussions of the macro-economic aspects of income-redistribution have generally ignored the interdependence of consumption preferences and relied on estimates of consumption behaviour based on a given distribution of income. If income-redistribution is to be employed as a policy weapon for changing the aggregate propensity to consume, or if the effects of income-redistribution undertaken for other reasons are to be predicted with accuracy, some attention must be paid to the questions of the existence and nature of interdependence of consumption behaviour.[1]

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[1] Dr. J. de V. Graaff has pointed out to me that these remarks do not apply to empirical studies of the consumption function which employ a coefficient of inequality of income distribution as one of the independent variables; cf., for example, Hans Staehle, "Short-Period Variations in the Distribution of Incomes", *Review of Economic Statistics*, Vol. XIX, No. 3 (August, 1937), pp. 133-143.

The Economist's Description of Business Behaviour[1]

By G. F. Thirlby

1.—" *The First Approximation* ".

The subject of this paper is the idea that the business man fixes his output at that level at which the surplus of his total revenue over his total cost is maximised, and, accordingly, at which his marginal cost and marginal revenue have been brought nearly[2] to equality. It is (sometimes) admitted or asserted that this description is only a first approximation to a description of actual behaviour. I shall accordingly, and for brevity's sake, refer to it as " the first approximation ". I propose to discuss its limitations, and what we have to do with it before we have something which really comes anywhere near to being a description of a business man's and a business organisation's behaviour.

At each step, I shall first examine the shortcomings of the first approximation as a description of the behaviour of the business man who has no human associates in the business, and then proceed to discuss their significance for the situation in which the business consists of more than one man, that is to say, where the business consists of an organisation of human beings. Economists—I am speaking rather of economists operating in the realm of pure theory, and using this marginal cost/marginal revenue " technique "—do sometimes speak of a " firm ", but rarely does the " firm " become anything really different from the man combining factors. It is true that one of these factors is " labour ", but labour is thought of as if it were a substance of which the owner sells a quantity to the " man " (" entrepreneur ") or " firm ". After this moment of sale, the previous owner of the labour (the labourer) appears to be decisionless with respect to the use of the labour that he has sold : there is still only one man concerned with the " firm's " planning operations which dispose of that labour.

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[1] For helpful comment on the draft of this paper, I should like to thank particularly Mr. Jack Wiseman and Professors G. L. S. Shackle, H. A. Simon and H. M. Robertson.

[2] I say " nearly " because we say " marginal cost *equals* marginal revenue " only when we forget (*a*) that the position of equality is a position of indifference and (*b*) the *minimum sensibile.* In administrative theory both of these things are important.

Yet it is not always true that there is only one man taking part in the " firm's " planning. Sometimes another person, just as much as the first, is a planner, making responsible decisions, based on uncertain estimates of future events, and taking his part in the determination of the organisation's plan and executory operations. The neglect of this case in economic theory is due, I imagine, to some inhibition in economists against recognising the existence of an organisation of men. In oral discussion with colleagues, I have noticed the tendency to dismiss the relationships between the contributory decision-maker and the other members of the organisation, as matters of internal politics. Whether the organisational relationships which develop a " maximised " cost/revenue situation are politics, while the market relationships which develop a price are economics, does not seem to me to matter. What does matter, and is distressing, is that the organisational relationships should fall between two stools (economics and politics), and make it necessary to establish a new subject called administrative theory.

The first approximation is probably so-called partly because the costs and revenues are supposed to be money, while it is admitted that a business man is not necessarily striving, always and exclusively, for a maximum surplus of money revenue over money cost. In other words, the implicit statement of the man's value judgment, or policy-making judgment, is not quite correct. This value judgment, and other subjective judgments, we shall have to discuss. They become particularly significant when we come to study the organisation. But it would be better to return to them after we have referred to the timeless equilibrium setting of the marginal cost/marginal revenue " equation ".

2.—*The timeless equilibrium setting of the equation. The suppression of the planning operation and the evasion of doctrine. The suppression of " the organisation " and the concepts which its treatment requires. Authority and authoritarianism.*

To make the equation conform to anything like business reality, this timeless equilibrium setting has to be seriously altered. The business man does not make a decision about a situation with which he is already " in equilibrium ": while out of equilibrium with the situation, he makes a decision to bring himself into equilibrium with it.[1] Neither are his results achieved simultaneously with the making of his decision, or in a state of timelessness: a period of time elapses between the making of the decision and the achievement of the results. To put this matter right it is necessary to substitute for the timeless situation a situation in which there is a planner who plans for a period ahead, proceeds to carry out that plan, and is in equilibrium while, and to the extent that, he continues to do so, that is to say, so long as, in the course of the period, nothing happens to render him unable to continue to carry out his plan, or to cause him to change his plan.[2] As I see it, this continuing, or period, equilibrium corresponds exactly with what we understand in business administration by production under *standing orders*. In execution of the standing orders, various conversions of money into factors, factors into products, and products into money may occur *in equilibrium*, that is, with no new decision following the decision which laid down the standing orders, or with no change of plan.

But my main object in insisting on the introduction of the time dimension is to stress the planning operations preceding the period of execution. A mental deliberation or planning operation, followed by a decision, precedes the business operations which are so planned. I think this should be more definitely stressed even where we are speaking of one-man businesses. To do so would keep in front of our minds the high degree of subjectivity in the maximisation process, performed as it must be in advance of the market operations, and based as it must be on advance calculations, or forecasts, of the market conditions (factor and product prices) that will obtain when those market operations occur. It would prevent our attributing, as we are so prone to do, a false objectivity to the cost and revenue figures to which the business man is supposed to respond. " Uncertainty ", so often completely forgotten, or regarded as a " trimming ", by economists, is something that it would be disastrous not to introduce into administrative theory at the outset. If money revenue is the business man's sole aim, cost, as well as revenue, is always somebody's uncertain, fallible estimate or projection of future prices[1] and is a " function " of that particular person's mind. If the first approximation allows us to forget this, it becomes a " vicious abstraction ".[2]

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[1] On this, see Mises: *Human Action, 1949.*

[2] *Cf.* Hayek: " Economics and Knowledge," *Economica*, N.S., Vol. IV, No. 13, February 1937.

To fail to bring the planning stage to the surface perhaps does not matter so much—though I rather think it does—while we are still confining our attention to the one-man business. To continue to suppress it when we are supposed to be talking of an organisation—whether this be an English joint-stock company, or whether it be Russia—is to neglect more than half of the problem. It is to do more than this. It is to fail to provide a discipline for a vast literature which concerns itself with business " organisation ", " efficiency ", " planning ", " costing " and so on, but which has often proceeded without benefit of the notion of maximisation, or without adequate recognition of it. Moreover, it allows, by default, the emergence of the view that the large organisation operates under a single planning mind, and, by not looking into the nature of the organisation's authority relationships, allows to persist, if it does not propagate, authoritarian views of a very naïve order. The persistent " *he* will adjust his output . . . ", *he* will do this and *he* will do that, coming from teachers and students alike, is extremely irritating and provoking to anybody who has made a disciplined inquiry into these matters.

The situation that we have to face, and introduce into our discussion, as a first step in the direction of describing organisation behaviour, is one which fulfils the following conditions. The work of planning leading to the plan which is calculated to maximise the surplus of revenue over cost is shared by a number of people. Their tentative plans have to be co-ordinated with one another. A's (definite) plan will depend on what B's tentative planning is: B's (definite) plan will depend on what A's tentative planning is. For example, a sales *schedule* (A's) has to be co-ordinated with a purchases *schedule* (B's). This has to happen before the organisation's maximised plan, and each member's sectional plan, becomes definite and settled by a *composite decision* or co-ordinated decision *ex ante*.[3] Each of these people has necessarily to make uncertain forecasts of what is going to happen, and be responsible for those forecasts. It is impossible that A should know all that B knows about the situation that B has to deal with (say the buying market), and it is impossible that B should know all that A knows about the situation that A has to deal with (say the selling market). Thus, willy nilly, A has to trust B and his uncertain judgments, and B has to trust A and his uncertain judgments. That is to say, it is recognised that the total situation is beyond the capacity of either A or B to deal with. And of course it is implied that A and B feel that they are better off if they work together as an organisation than they would be if they worked separately.

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[1] This does *not* contradict my assertion, below, that costs are not necessarily *factor* prices.

[2] A term I have taken from Bradley.

[3] Professor H. A. Simon uses the expression " composite decision ". This is equivalent to the expression " co-ordinated decision *ex ante* " which I have used elsewhere. (See H. A. Simon, *Administrative Behavior*, *1947*, and G. F. Thirlby, " The Subjective Theory of Value and Accounting ' Cost '," *Economica*, N.S., Vol. XIII, No. 49, February 1946.)

This is the situation that, as I see it, has to be brought into any satisfactory description of the business organisation. It incidentally raises the authority issues. The crucial issues, or some of them, can be forced to the front by assuming that A and B are equal partners and the only members of the organisation. If authority is a property of organisation, there must be authority here, for this is an organisation. The organisation's maximised plan becomes the organisation's standing orders. The *composite decision* which settles the plan operates as an order to carry out the plan : in this case an order by A and B as a committee issued to A and to B as subordinates to it. But, although the order issues from above (the committee), the authority, or authoritativeness, of the plan, and hence of the order, *moves up from below*, that is to say, from A and B as subordinate planners in " the organisation ". For it is implicit in the assumptions that in the planning and co-ordination process A cannot expect to override B's judgment within B's sphere, and B cannot expect to override A's judgment within A's sphere. Arbitrary attempts so to override one another on committee would interfere with the development of an order (the committee decision) which would be accepted by A and B *without psychological resistance*—the harmony condition of authority.

I have little doubt that at this point many people would wish to substitute for the committee a third person, X, whose job it is to " manage " A and B. If we make this substitution, either we assume that X usurps the functions which we have given to A and B, or we do not assume this. If we *do*, then the " larger " the organisation (" larger " referring to the degree to which the planning and uncertainty judgments surpass the capacity of one man) the nearer we come to assuming the omniprescient head—unsustainable authoritarianism. If we do *not* assume that X usurps A and B, then we are driven to admit that X must get his purchases and sales figures from the minds of A and B—and trust those people. Authority still moves up from below.

Of course, X might have a " staff-man " to collect the figures for him. Then either the " staff-man " usurps the functions of A and/or B, or he does not. If he does—this sometimes happens—the position is the same as before: the " staff-man " *becomes* A and/or B. If the " staff-man " does not usurp A or B, then he must get the figures from their minds. Authority still moves up from below.

I shall not here attempt to explain how X and his " staff-man " may make a show of " managing " by short-circuiting the minds of A and B, and using records (some of them pseudo or " conventional ") instead. But I have no doubt that this procedure goes a long way to explain why some people receive the impression that firms adjust their market operations in a way which appears to defeat or ignore the marginal principle.

My illustration is highly abstract and inadequate, and leaves me open to attack at many points. But it does suggest some of the issues that the first approximation slurs over when it abstracts altogether from the planning operations of the organisation.

3.—*The obscurity about cost. A restatement.*

In the last section I referred to the business man's decision to conduct a series of planned operations over the future. This planned course of action might be a course of action to produce, not necessarily only one product, but possibly a number of different products, and to produce them in different proportions on a number of different dates. And possibly it would include lending and borrowing operations as well. This particular plan is simply the one chosen from possibly many contemplated alternative particular arrangements or distributions of *the same resources*. It is necessary to define this entity " the same resources ".

How are we to define the resources as they exist for the man's planning purposes, *independently of*, or prior to, the cost and revenue calculations which determined the chosen distribution? They must, I think, be deemed to include the following elements:

(1) Such money and goods as the man has at the outset.

(2) His " knowledge " or " prescience " (including uncertain judgments and mistaken beliefs) concerning the loans that he might be able to negotiate, and the factors and products into which he might be able to convert his original assets and these loans. The " knowledge " will include his views about the (future) prices of the loans, factors and products. If the man knows John Smith, a dealer in linen thread, and feels fairly certain that John Smith would sell him a certain quantity of linen thread next week at a price which he feels fairly certain about, too, he has this " knowledge " as part of his resources. How much of such knowledge he possesses will depend very much upon his unique business experience and the scope of his unique relationships with other people in " the market ", and the qualities and limitations of himself as a unique person. Any such assumption as that all factors and products of every conceivable kind are " priced ", and that all these (future !) prices are known, or " given ", to anybody who chooses to read them off, must be rejected out of hand. We are dealing, not with a master-mind (or, alternatively, with an automatic response to a " price-system "), but with a fallible and unique individual who is trying to discern the future, and whose range of observation of even the past and present is limited.

(3) The loans and factors themselves. That is to say, any loans and factors that the man thinks or believes would be in existence and available to him to acquire or buy if he wanted them for any production that he might plan. In the event, some of them might prove not to be in existence or available. None the less, his belief that they would be is a planning datum, and must be included for this purpose in " the same resources ".

These loans and factors will, or may be, available only as a set of alternatives from which to choose. That is to say, if he plans to acquire some, he may not be able to plan to acquire others. This for the obvious reason that his original assets and (so far as the acquisition of factors is concerned) the loans that he contemplates might be inadequate to secure them all. It would not be surprising, therefore, if Plan A contemplated the use of linen thread but no brass tacks, while an alternative Plan B contemplated the use of brass tacks but no linen thread. The idea that the two plans are alternative distributions of " the same resources " is not destroyed by this possibility. Both the linen thread and the brass tacks (and the man's knowledge about them) are part of " the same resources " that, in the man's opinion, are available for his planning activity.

Nor is the idea destroyed by the possibility that some of these resources (loans, at least) may be available for some purposes (e.g., work in which the man has special skill) but not for others. They are part of " the same resources " that, in the man's opinion, are available for his planning activity.

Thus " the same resources " are largely ideational in character, and would be irritatingly non-measurable to an external observer who felt that he ought to be able to measure them. They are very much in the way of being a " function " of the man's mind. Their limits are much to do with the limits of the man's mind.

I have said, then, that the man adopts one particular distribution of " the same resources " as his plan or accepted course of action, and that this plan will contemplate the *use*, for the purpose of earning revenue, of some or all of " the same resources ". The " revenue " that we think of in the first approximation is, or should be regarded as, the revenue that the man expects to accrue to him from the carrying out of this plan. This is the ideational, imaginary, planned or expected revenue whose surplus over cost he deems, in the planning stage, to be maximised. What then is the " cost " ?

It is often very difficult to understand what economists mean by cost when they are discussing the marginal cost/marginal revenue equation. But it is probable that at least sometimes what is meant is the sum of the prices of the factors to be used in the chosen course of action. These prices may be buying or selling prices, according to whether the " factors " are to be bought or are already owned. It is extremely difficult to know, sometimes, whether *all* the resources that are to be used, including the man's own capacity, and money, are supposed to be included in the factors so priced. However, this meaning (factor prices) is not, I maintain, an appropriate meaning of cost for the purpose in hand. Or, at the best, these factor prices represent only one of the various alternative opportunities that might be confronting the man when he is about to make his decision.

The appropriate meaning of cost is the *revenue*, from an alternative distribution of " the same resources ", that he would expect to achieve if, instead of his accepted course of action, he adopted that course which would yield the second highest revenue. It is the (greatest) estimated alternative productivity of " the same resources ", rather than their prices as factors, that we have to regard as cost. The two things might conceivably be one and the same: the best alternative to taking the accepted course of action might be to sell (or not buy) " the same resources " or their services as such. But this is not necessarily so. The best alternative could be an alternative complex of activities to produce an alternative complex of the same products or different products or some of each. Consequently we need to adopt a meaning for cost which covers the cases where the best alternative is, not to sell (or not buy) " the same resources ", but to do something else with them. And we need to do this notwithstanding anything that may be said to the contrary in " static ", or other, equilibrium analysis. We are not assuming that the man is planning or operating in any kind of equilibrium, or other, conditions that require these two things to be the same.[1] We do not say how many different opportunities of making money he sees, or thinks he sees, in the rest of the " system ". Consequently we define cost as his best alternative revenue rather than as the sum of the factor prices. If any adjustment is implied, I would make just this amount of adjustment to Professor Lionel C. Robbins's description of opportunity cost in his " Certain Aspects of the Theory of Costs ".[2] Otherwise I would adopt his definition.

I would emphasise that this adjustment of the meaning of cost from factor prices to rejected alternative revenue does not in any way rule out the relevance of factor prices in planning, or in the determination of cost.[3] Whether the man will include the *use* of John Smith's linen thread in one alternative plan or another will surely depend partly upon the level of the price that he contemplates having to pay for it. For the level of this price will be one determinant of the quantity of linen thread that he will be able to get with a given input of money. Hence it may be one determinant of the size of an output (of say, boots). Hence it may be a determinant of revenue from this output—on Plan A. And, as the sacrifice of this revenue may be the cost of achieving a revenue on an alternative plan B (which, incidentally, may not contemplate the *use* of linen thread at all), the (expected) price of linen thread may be a determinant of cost.

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[1] If there is any profound reason why this implies that the man will not be able to carry out his plan, I should like to point out that I have not anywhere stated that he *will* be able to carry out his plan.

[2] *E.J.*, Vol. XLIV, March 1934.

[3] Neither is it intended to belittle the significance of estimating future factor prices and calculating variations in prices and their sums which would be expected to accompany variations in planned production processes and outputs (" production functions "). Quite the contrary. But it is intended to take care of the situation in which the business man's cost calculation with respect to a particular product is not completed until he has looked at his *alternative product* demand curves as well as his factor supply curves, and calculated all the revenue he expects to lose by devoting resources (total or marginal) to this product instead of doing something else with them. It incidentally takes care of all interdependencies, including interdependencies of demand curves.

I have not yet said what *marginal* cost is. A marginal cost is simply the revenue that the man expects to lose in one direction (to be set against the revenue that he expects to gain in another direction—the marginal revenue) by shifting his proposed application of *some part* of " the same resources ", for example, by shifting some from product A to product B, or from the money market to a product, or from personal consumption[1] to business investment, or from investment on day 1 to investment on day 2, or from " idleness " to investment. Clearly, one such shift occurs in moving from the " second best " plan to the " best " plan. Clearly, the marginal revenue involved is greater than the marginal cost involved: net revenue is positive. Or, reversing the process, the marginal revenue involved in moving from the " best " to the " second best " plan is less than the marginal cost involved: net revenue is negative.

Up to this point I have spoken of the man's aim as being the maximisation of the surplus of revenue over cost. It is now no longer necessary—indeed, it is very nearly erroneous—to do this. It is enough to speak of maximising revenue. To maximise revenue is to choose the best or greatest of all the alternative revenues that are in mind. There is a surplus of the best over the next best (cost), but to speak of maximising this surplus is to contradict the assertion that the two revenues are the best and the next best.[1] Let us henceforward speak simply of maximising revenue.

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[1] It should be noticed that, because the maximisation of the surplus of money revenue over money cost is the man's single end, he will, apparently, reserve to himself " leisure " and resources for food and other personal consumption only in so far as he thinks that to do so will indirectly increase the size of his ultimate money surplus.

I come, now, to the substitution of " the organisation " for " the man ". Cost, for the organisation, would still refer to the revenue of the " best " of the rejected alternative plans that were under consideration in the planning stage and rejected by the composite decision. But the constitution of this rejected plan, like the constitution of the accepted plan, would be the result of the planning activity and (interpersonal) co-ordination of a number of collaborating minds, instead of being merely the result of the co-ordination of the processes of a single mind. Hence, " discovery " of the cost, and how it was arrived at, would have to overcome corresponding complexities. Marginal cost would still refer to the revenue expected to be lost in one direction by shifting the proposed application of some part of " the same resources "—possibly, now, by shifting it from one member's use to another member's use. " The same resources " and their application would have to be thought of in the same way for the organisation as for the man, except that (*a*) the limit to " the same resources " would depend on the capacities and views of a number of collaborating people instead of one person, and (*b*) we should have to bear in mind that the amount of the organisation member's personal resources that becomes organisation resources (and, consequently, the amount of personal " leisure ", and so on, that he sacrifices) is fixed by bargain and contract between that member as a person and the other organisation members or the organisation as such. So is the member's remuneration for what he so contributes, whether this remuneration is a definite sum, whether it is the residual revenue that is to be maximised, or whether it is a definite share in that residual revenue.

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[1] I should have no objection to allowing cost to mean the " worst " (or some other) revenue, instead of the " next best " revenue, and so making sense of the expression " maximise the *surplus* of revenue over cost ". (And if one of the alternative behaviours were " holding idle ", the expected outcome being money so held idle, I should of course be willing to include this outcome in the list of alternative revenues, and should have no objection to regarding it as cost.) I should have no objection to this providing that everybody agreed that cost did still mean " revenue " (or the idle money outcome) and not the resources that the man has at the outset, as such.

It would be possible to go further and allow cost to mean these resources as such. I should have no objection to this either, providing that everybody agreed that cost did mean this, and that nobody then tried to subtract cost from revenue to give profit or net revenue or income. The resources never are homogeneous : the man has at least himself as well as any money he may have. To begin to " price " the resources in order to make them summable, is to begin to convert them into the money yield (revenue) that the man thinks he could get for them. It is either this or much-practised pseudo-objective nonsense !

4.—*The suppressed value judgments. Non-monetary ends and marginal costs.* Intra *and* ultra vires *policy-making as affecting the operation of the marginal principle in the organisation. Identification.*

We can now return to the value judgments which the first approximation obscures. I have already referred to the assumption that the man's single aim is to maximise money revenue, and to the admission that this assumption may not be quite correct. A man may relax this valued aim somewhat to allow, say, for his preference for producing the kind of product that he " likes ", or for his preference for " leisure " or food (valued because he " likes " them as ends, and not merely as indirect means to maximise his money revenue) or even for his preference for being benevolent towards other people. His " net satisfactions " may be greater if he does so. In other words, the man may have other ultimate ends, or rather other ends *pen*ultimate to " value ", besides the end of money revenue.

The significance of the possible presence of these other ends is just this. In so far as the man has them, his pursuit of money revenue maximisation will be restricted by marginal costs which will be, not exclusively alternative marginal money revenue, but his valuation of the marginal achievement of these other ends—e.g., additional " leisure " to be enjoyed as a valued end. Or revenues will be " weighted " by the other valued ends that the man expects to achieve in the process of earning the revenues—e.g., when he " likes " making one product more than another. In either case, his resources will be partly devoted to the achievement of ends other than revenue maximisation. This is the main point. But we should notice, incidentally, that if, in these circumstances, we desired a concise expression to describe the man's optimum distribution of his resources, and to indicate what we meant by cost, we should be driven to say that he adopts a course of action which maximises his *value*,[1] and that the cost is the *value*,[1] from an alternative distribution of " the same resources ", that he would expect to achieve if, instead of his accepted course of action, he adopted that course which would yield the second highest *value*.[1] This is what happens to us when we remove the over-simplification in the assumption that the man's value judgment makes revenue maximisation his single end. We get back to the old-fashioned description of rational behaviour.[1]

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[1] Or values, or satisfaction, or utility, or ophelimity, or something like that.

I want now to suggest how the introduction of these other valued ends affects *organisation* behaviour.

To make a value judgment as part of an effective decision is to make policy. Whether it can be distinguished in practice or not, this act of policy-making can be distinguished in thought from the acts of administration and execution which implement the policy. When the subject of our inquiry is the man working alone, this distinction may not be a matter of great significance. The man is assumed to approve what he decides to do and does. That is the end of the matter. There is no problem of whether his decisions and actions are in accord with his policy. If they were not, he would be presumed to be irrational or mad.[1]

When the subject is the organisation, however, we are in a different position. It is obviously possible for an organisation member to make a decision which is inconsistent with the policy or approved aims of the organisation, that is to say, to allow his personal value judgments to intrude, or to allow his misguided " identification "[2] with a department, person or practice to intrude. For example, he might decide to make product A, rather than product B, because he personally " liked " making product A, or because he was " identified " with the Product A Department, although he thought product B would yield more revenue, and although the organisation policy was to maximise revenue regardless of product. Such a person is not necessarily irrational (mad), although, in such circumstances, " the organisation " may be.[3]

But this *deliberate* intrusion of personal values, and this misplaced identification, are not the only aspects of the matter. It is often very difficult to see how administrative decision-making can be delegated without driving the administrator into making policy himself. Suppose, for example, that it was the organisation's policy to make product A rather than other products, even at *some* loss of revenue, because it (or its policy-makers) had a special " liking " for making product A. Then the problem of devising a policy-directive giving the weights to attach to the A marginal revenues so as to allow the administrator to measure them against the marginal revenues of other products, would be difficult if not insuperable. Again, suppose that it was the policy of the organisation to provide some " welfare " at the expense of some revenue, that is to say, because it " liked " providing welfare and not merely because it regarded the provision of " welfare " as a means of increasing revenue. Here again the problem of devising a policy-directive giving *the descriptions of tangibles*[1] that were supposed to yield " welfare ", and the weights to attach to them, so as to allow administrators to measure them against the marginal revenues of products, would be difficult if not insuperable. The only rational way out of the difficulty would seem to be to provide for discussion between administrators and policy-makers proper, and for *tentative administrative plans to be submitted for confirmation to policy-makers proper*. There is then a meeting of minds and a two-way flow of ideas. Policy-makers can eventually " value " and select from the alternative plans which the administrators submit to them. Administrators thus have the means of making their plans definite without themselves making policy.

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[1] See Mises (*op cit.*).

[2] For a fuller discussion of " identification," see H. A. Simon (*op. cit.*).

[3] Fortunately for us, it has not been possible to put organisations into lunatic asylums.

It might be thought that another way out of this difficulty would be to delegate policy-making itself to the administrator. The members of a company might be thought to delegate policy-making to its board of directors. But this situation is surely morally intolerable. To delegate policy-making is to permit somebody else to make one's ethical judgments for one. A person joining an organisation accepts, not any aim that some other member chooses to adopt subsequently, but the aim which he and all other members at that time accept in common. He accepts ethical or moral responsibility for pursuing that aim. It would seem, then, that the making, or changing, of policy without common consent is necessarily a change *ultra vires*—that policy-making cannot be delegated.[2] If policy-making could be delegated, and if a company delegated policy-making to its board of directors, the board would be at liberty to devote all the resources of the company to charitable works, or whatever else it saw fit to regard as " good ".[1]

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[1] This cannot be avoided by a directive which simply allows so much money to be allotted to undefined " welfare ". Under such a directive the administrator could define " welfare " as putting the money into his own pocket.

[2] This is not to say that there cannot be a considerable degree of common understanding of what policy is, even though no explicit policy statements or directives are issued : no doubt a man joining a business firm assumes that it is there largely to make money. The point is rather this. When the number of members is large, it becomes difficult to get and maintain common consent to a common policy which binds members to pursue a common end. But if the many try to leave policy-determination to the few, the moral issue arises. When I say that policy-making (as distinct from administration) cannot be delegated, I mean that A who directs B to pursue A's ends for him cannot be presumed not to have defined or determined

So far, then, I have suggested that what the organisation's output is, and what are the *marginal costs*, or marginal *values*, that are determining it, may depend partly upon the presence of *ultra vires* policy-making within the body of the organisation, either because of the intrusion of personal values, or because of misguided identification, or because administrators without appropriate policy-directives are driven to make policy. A serious inquiry into the determination of a business organisation's " output " would have to be prepared to " discover " whether influences of this kind were at work. It should be noticed, incidentally, that if it did find these influences at work, it would not have disproved the marginal *principle*[2] though it would have discovered marginal costs and marginal values whose introduction rendered the organisation behaviour irrational.

Such an inquiry would not be easy. Even in the one-man business, it would be difficult enough to discover, from the man's mind, how far he was forecasting achievements of other ends than revenue, and setting the forecasts against, or adding them to, his forecasted achievements of revenue. Indeed, he might himself be only partly conscious of what he was doing. In an organisation, a serious inquiry would be much more complex. It would have to probe the minds of more than one person. It would have to study the effects of meetings of minds. These meetings, whether for the purpose of securing the administrative composite decision,[3] or for the purpose of reconciling administration and policy, would not necessarily proceed through formal committee

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those ends, and valued, approved of, or accepted moral responsibility for those ends as fit to be pursued. (If A were a group, perhaps including B, I should say this of each person in the group. This personal responsibility cannot, I suggest, be eliminated simply because the persons have formed an organisation.)

[1] To assume that the board is the policy-maker (and consequently that the shareholders are infants without moral responsibility) does not dispose of the issue in question, but only shifts its locus to the relationship between the board and the subordinates to whom the board delegates administration.

[2] If economists want to study organisation pathology, they should go about it in the right way, and not be too ready to scrap principles of their own which some of them have ceased to understand.

[3] Economists, who appreciate the abstraction of a " market price ", should have no difficulty in grasping the idea of a composite decision as a similar abstraction.

meetings : as likely as not the link-up would occur in informal discussions.

The investigation would have to be wary of misplaced identification. This I have mentioned before, but it needs further stress. In an organisation, people are *necessarily* in some sense specialised : to say this is to say no more than that the organisation's activities are divided amongst the people in it. A man, or a " department " of men, might be specialised to the production of a " product ", or to " plant maintenance ", or to " welfare " activities, or to " accounting ". Either because they personally like the activity, or because they get their living at it, or for some other reason, people so specialised sometimes " identify " themselves with the departmental end rather than the organisation's end, and, when they are before the co-ordinating body, " push " their departmental end, and press for resources to achieve it. Incidentally, they are likely to develop standards or practices relating to their specialism, and " push " these, even, sometimes, where they are inappropriate. Sometimes these standards or practices are those of a profession to which the people belong and with which they are " identified ", recognising the profession as a group or organisation superordinate to the business organisation in which they are working. It is notorious that accountants are " identified " with the practice of " attaching " and " expiring " : I have written about that elsewhere.[1] At least some of them develop a pseudo-objective " cost " calculation, which includes these arbitrary attachments, and which an unwary and uninitiated investigator might be led into substituting for the estimates of alternative revenues (and alternative " values ") that I have been discussing. Misleading inferences about how " output " was determined might follow. I have no hesitation in adding that it is to such " cost " calculations that I was referring, in section 2, when I spoke of the behaviour (which I should now describe as organisationally irrational) of the " manager " and his " staff-man ".

5.—*Other suppressed subjective judgments. Time preference. Policy-making and administrative judgments affecting marginal cost.*

In the last section I supposed the value judgment to be relaxed so as to allow the man to be pursuing another end besides money revenue. Sometimes it is admitted that, even though money revenue is deemed to be the single end, another value judgment intrudes as soon as we think of maximisation of revenue *over time*. This appears in the determination of what is known as the rate at which future revenues are discounted. Money may be planned to come in (or go out) at different times and in different quantities over the future. These planned times and quantities may be varied. The man may prefer a pound at one date to a pound at another date, and plan to get it at one date rather than the other. This relative preference affects the meaning of maximisation, even given that money is otherwise the single aim.

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[1] G. F. Thirlby (*op. cit.*).

But to understand how much of this preference is of the value judgment nature—how much of it is "policy"—we have to analyse it a little. Let us momentarily abstract from all elements of uncertainty about the possibility of accrual of the pound at either of the two alternative dates. Then the preference for the pound at one date rather than the other can be due to one of two things.

First, the man may prefer the pound at one date rather than the other because he "likes" or "values" it more at that date, possibly because he wants to withdraw money for personal consumption at that date rather than at the other—for personal consumption over and above what he requires to enable him to maximise revenue. This preferred date may be the date of the planned termination of the operating period (or infinity!) or the planned date of some interim drawing. My suggestion is that the decision settling the date of the termination of the period (the termination of the business operations) and the decision settling the date of interim drawings (which can be regarded as partial terminations of the business) are of the nature of value judgments (policy decisions) which are necessary adjuncts to the simple statement which says that the aim is to maximise revenue, but which says nothing about the length of the operating period. It would follow that if, *in an organisation* (e.g. a company), the policy-making body (e.g. a body including shareholders) was distinguishable from the administrative final co-ordinating centre (e.g. the board of directors), these decisions should be made by the policy-making body, and that the administrators should administer in accordance with the decisions so made.[1] This would require either a policy-directive laying down the time-preference for revenue-withdrawals, or the kind of discussion between administrators and policy-makers, and joint settlement of plans, to which I referred before. Otherwise administrators would be driven into policy-making. It should hardly be necessary for me to add that the introduction of this time-preference affects marginal costs : a pound earnable at one date is no longer necessarily equivalent to a pound earnable at another date.

Secondly, the man may prefer the accrual of the pound at one date rather than the other on the ground that he expects its accrual at that date to lead, through better opportunities for its reinvestment, to greater revenue in the end, or according to his scale of preference with regard to dates of withdrawal. In this case there appears to be no (additional) value judgment involved : the case is covered by the decision, and the value judgment involved in it, to maximise revenue in the end, or according to the scale of preference for withdrawals. This would mean that in the organisation no additional policy-directive to administrators would be required, and that they could make this type of decision without reference back to the policy-makers. That is to say, given the policy-makers' scale of preference with regard to dates of withdrawal, the administrators would make the disinvestment and reinvestment decisions. Once again, marginal cost is affected, this time by an administrative judgment which appraises the revenue to be sacrificed by an earlier or later disinvestment and reinvestment.

I would emphasise that neither of these preferences for a pound at one date rather than the other has anything to do with relative uncertainty of accrual. I have abstracted from this matter, not because it is of small importance, but because these relative uncertainties about accruals at *alternative* times can be regarded—from the point of view of whether the decision about them involves another value judgment—in the same way as relative uncertainties about alternative accruals at the *same* time. It is to this problem that I now turn.

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[1] Whether or not this view is correct, it should be clear that administrative behaviour should be *co-ordinated* to secure that all administrators are working to the same range of preference regarding the dates at which revenue is to accrue or be maximised : otherwise an administrator of one section of the total plan might be working to maximise at the day after tomorrow, while another was working to maximise ten years later.

Let us suppose that our business man is concerned with a choice between two alternative courses of action which he believes would yield revenue. He states that if he took the first course he would be surprised if its revenue fell outside the limits of 10 and 20; if he took the second course he would be surprised if its revenue fell outside the limits of 5 and 30.

I take the view that the question of which of these prospective revenues is the greater is not capable of being answered "objectively", and consequently that the simple statement of the aim to maximise revenue has to be modified or elaborated to allow for the subjective judgment about which is the better risk to take or uncertainty to face. In this case in which the lower and higher limits of the one revenue fall respectively below and above those of the other revenue, the man's decision seems to depend upon how much he "likes" risk-taking, and accordingly involves a new value judgment, affecting what is meant by maximisation of revenue and by marginal cost. It would seem to follow that, in an organisation, a decision of this type would require the expression of the preference of policy-makers. I do not profess to know how a policy-directive could be framed for the purpose!

Now let us alter the example. Let it be otherwise the same, but let the revenue limits be 10 and 20 for one course of action and 25 and 35 for the other. It seems to be clear that, in this case, the man, in pursuit of revenue maximisation, could firmly choose the 25 to 35 alternative without making any new value judgment.

There is, of course, a subjective judgment involved. Uncertainty is involved. As far as we know, it is only *he* who is relatively certain that the limits are 25 and 35: only *he* who would be 'surprised' if the revenue fell outside those limits. If other people instead of this man were in his decisional position at the time of his decision, their opinions might be different from his. And he (or they) might be wrong in the event. Similarly for the administrator in the organisation. It would seem that decisions of this type, which do not depend on the decision-maker's special taste for risks, could be delegated by the organisation's policy-makers to administrators, and that the subjective judgment involved is the element of judgment which is always involved in *administration*, but which is perhaps distinguishable from the value judgment involved in *policy-making.*[1]

This section might be summarised thus. What the man working alone would mean by maximisation of revenue and hence by marginal cost, would depend, not only upon his (*administrative*) views about when he should disinvest in order to reinvest, but also upon his *policy* defining the time or times at which he wished to withdraw revenue; not only upon his uncertain *administrative* judgment about revenues he could achieve in the future, but also upon his *policy* towards risk-taking. The meaning of maximisation of revenue by an *organisation* would depend upon the same administrative and policy-making judgments, with added complexities. These judgments are not all made by one person. The difficulties of disentangling administration and policy-making, and of devising appropriate policy-directives would probably lead to *ultra vires* policy-making. The alternative to the policy-directive, as a provision against *ultra vires* policy-making, is constant contact between policy-makers and administrators. I might add that this would limit the size of the organisation in terms of number of members.

The London School of Economics.

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[1] The influence of G. L. S. Shackle in these last few paragraphs will be apparent. Professor Shackle, who kindly read this paper in draft, suggested that the illustration of the distinction between administrative decisions and policy-making decisions might be compared with the distinction, in his *Expectation in Economics*, *1949*, between deciding on the shape of a " potential surprise curve ", and choosing between two points on a " gambler-indifference map ".

The Inequality of Incomes in the United Kingdom

By E. C. Rhodes

One of the difficulties with which we have to contend in work on distribution of incomes is due to lack of complete data. We rely for information of value on the annual reports of the Commissioners of Inland Revenue, and the data which form the subject matter of tables in these reports are obtained by them in the course of their duties. Consequently, the lowest limits of income in such tables are determined by legislation on income tax. With the gradual lowering of the tax exemption limit in recent years we are now getting possession of data which relate to nearly the whole population. An important new table was given in the 92nd Report (table 87) where incomes were classified by family circumstances for the year 1948–49. These figures are described in the report as provisional and there may be some error, but the facts are important and it is worth while analysing them.

Table I is concerned with the number of incomes and the number of persons involved in the tabulation.

TABLE I

1948–49. NUMBER OF INCOMES AND NUMBER OF PERSONS (IN THOUSANDS)

Incomes		*Persons*			
		Income Receivers and Spouses	*Children*	*Dependents*	*Totals*
Single and Widowed Persons ..	10,381	10,381	717	2,470	13,568
Married Couples..	10,369	20,738	10,858	1,010	32,606
Totals	20,750	31,119	11,575	3,480	46,174

The facts in table 87 of the 92nd Report, from which Table I has been derived, are obtained from the statements and claims made on the income tax forms. The term "dependent", as is explained in the report, is used to cover cases where allowance is claimed for a dependent relative or a resident housekeeper. The claims for children enable the numbers of children to be estimated in this table. In the report, it is stated that possibly these figures are not absolutely accurate because persons not liable to tax may not claim all the allowances due to them.

We may estimate the total population in 1948–49 as 50,100,000 (in round figures) and the total in Table I thus involves about 92 per cent. of the population. In the table from which our Table I is derived, the lowest income limit is £135. The other 8 per cent. of the population not included in Table I would be accounted for by those income receivers with less than £135, omissions of those persons who are in receipt of income above the limit, but who are not known to the tax authorities, errors and omissions referred to in the Report, some children respecting whom no claim can be made, and possibly other categories. But, to a considerable extent table 87 in the Report is concerned with nearly the whole of the population. It must be remembered that the term " children " in Table I refers only to children about whom claims are made; it does not refer to the total offspring of married persons.

The total number of incomes is 20,750,000, divided into roughly two equal parts—one " single " incomes, the other " married " incomes. The " married " group includes cases where there is one income receiver and a spouse who is dependent and cases where both spouses are income receivers, the joint income becoming a single " married " income. Also, it must be remembered that the income for both groups may be wholly earned, wholly investment, or partly earned and partly investment, income. Table 87 does not give any information about the source of the income, but it is apparent that within the classes " single " and " married " there are many possible subdivisions. In the " married " class, for instance, there will be cases where the income is merely the earned income of a husband, and cases where both husband and wife have both earned and investment incomes. In the " single " class there will be cases of men with incomes earned, investment or mixed and of women with similar incomes. There will be cases of young women of 25 earning an income, and widows of 70 living on an investment income produced by savings left by a deceased husband. We note that nearly all the children are in the " married " group and about 70 per cent. of the " dependents " are in the " single " group.

Table 87 classifies the two groups of "single" and "married" incomes according to the number of children up to 4 and the number of dependents up to 2. We have these figures in Table II.

TABLE II

NUMBER OF INCOMES BY FAMILY CIRCUMSTANCES (IN THOUSANDS)

												Total
Children ..	0	0	0	1	1	2	2	3	3	4	4	
Dependents ..	0	1	2	0	1	0	1	0	1	0	1	
Single	7,755	1,803	254	314	130	73	29	23	—	—	—	10,381
Married ..	3,624	397	47	3,155	249	1,502	154	751	77	376	39	10,369

Of all the 20,750,000 incomes, 7,755,000 or 37 per cent. are incomes of single persons without children or dependents. This category is the most important from the point of view of size. Married couples without children or dependents, 3,624,000, represent 17 per cent. of the total number of incomes; married couples with one child and no dependents account for 15 per cent. of the total. Married couples with three children and no dependents sometimes get a special mention in specimen tax tables showing liability at different income levels. This class accounts for less than 4 per cent. of the total number of incomes.

In table 87 in the Report, for each category shown in Table II we are given the distribution of incomes, the ranges being between the limits, in £'s, 135, 250, 500, 750, 1000, 1,500, 2,000, with a final group £2,000 and over. The table does not include the amounts of income by grades of income; the table gives only the number of incomes in each grade. It is possible, on certain reasonable assumptions, to find estimates of certain statistics which interest us, particularly the average incomes for each class and a measure of variation within each class. Table III summarises these results for each class of income.

In Table III there are shown for each class three "average" figures, the mode, the median and the mean, all of which are used on occasions as representative figures. The "mean" is the measure which is probably the best known; it indicates how much each income would be if all the incomes were equal, and is obtained easily by dividing the aggregate income by the number of income receivers. The "median" is that measure of the group which divides the group into two

TABLE III

INCOMES BY FAMILY CIRCUMSTANCES, AVERAGES AND MEAN DIFFERENCES

Children	0	0	0	1	1	2	2	3	3	4	4
Dependents	0	1	2	0	1	0	1	0	1	0	1
Single											
Mode (£)	194	213	226	201	226	173	233	256	—	—	—
Median (£)	231	260	270	243	270	217	260	314	—	—	—
Mean (£)	310	345	343	331	343	279	298	442	—	—	—
Mean Difference (£) ..	181	202	186	202	186	167	103	333	—	—	—
Relative Mean Difference ..	·58	·59	·54	·61	·54	·60	·35	·75	—	—	—
Married											
Mode (£)	228	233	239	227	239	228	239	228	239	228	239
Median (£)	322	318	319	291	319	306	319	306	319	306	319
Mean (£)	558	555	497	414	497	462	497	462	497	462	497
Mean Difference (£) ..	520	514	402	288	402	365	402	365	402	365	402
Relative Mean Difference ..	·93	·93	·81	·70	·81	·79	·81	·79	·81	·79	·81

equal parts; 50 per cent. of the group have incomes more than the median income, the other 50 per cent. have incomes less than this. The "mode" is that measure which occurs most frequently. If we were able to draw the frequency curve of incomes accurately, the peak of this curve would occur at the "modal" income. In one sense, the mode of a group is the measure we are thinking of when we wish to use as a representative of the group a typical case. The "typical" case is the one which stands out. When we were discussing Table II we noted that the income class of single persons with no children or dependents stood out as 37 per cent. of all incomes.

When we are dealing with income distributions and we wish to reduce a whole group of data to a single representative figure we have a difficult choice to make. For comparative purposes we should always use the same method of choosing. As a rule we choose the "mean"; but sometimes we may interpret the mean in discussion as the mode. These concepts are essentially different, and in our case they are completely different numerically. When we think of the mean income of married persons with no children or dependents as £558, we must remember that this is the figure obtained by dividing the aggregate income by the number of incomes. We must not think of it as the typical income in the sense that we would encounter persons with this income most frequently if we made a random survey of incomes of persons in this class. If we are thinking of the typical income in this sense we should use the mode as the representative. In some respects, the median is a useful figure, as it introduces the idea of a proportion of the group with incomes exceeding this figure. Thus, we can think of the married persons with no children or dependents as a group with half of them having incomes exceeding £322.

In our Table III we can see that, whichever measure we use as representative, for each class the married persons have incomes greater than the single persons, apart from the class with 3 children and no dependents. But, in this case the data for single persons consists only of 23,000 incomes and we should not care to place too much reliance on the figures for this class in Table III. The difficulty about the use of the mode, the median or the mean arises again if we wished to consider the differences between these measures for the two classes, single and married.

For the classes with no children and no dependents, the difference between the modes is £34, between the medians it is £91, and between the means it is £248. Which of these can be regarded as best expressing the difference between " average " single incomes and " average " married incomes ? But, if we were anxious to find an answer to such a question we should prefer to be able to have access to more detailed information, with facts about the kind of income, earned and investment, facts about the sex of single persons, facts about age, and then facts about employment and industry, and so on. We can certainly assert, from our data, that the general level of incomes of single persons is lower than that of married persons.

Our present interest is more concerned with the variation of incomes in the classes. We can measure this by using the mean difference. This is a measure which is obtained by getting the positive differences between all pairs of incomes, adding these and dividing by the total number of pairs. When this measure is small it means that a group has not as much variation as when this measure is large. For the small measure the incomes are more equal than when the measure is large. In Table III we see that the mean differences class by class are greater for the married than for the single. There is more variation in the married classes than in the single classes. But, as the general level is higher for the married than for the single, we get a better idea of the relative variability if we use the further measure—

the relative mean difference, which is obtained by dividing the mean difference by the mean. These measures in Table III show that the married classes have relatively more variability than the single classes, or, in the language generally associated with income distributions, the married classes show more inequality of incomes than do the single classes. This may be due to all kinds of causes, amongst which one may mention: the age of the persons concerned, age being a factor which influences incomes and in respect of which individuals are not equal; the proportion of males to females in the single group, earned incomes for females being more equally distributed than for males; the proportions of earned and investment incomes, earned incomes being more equally distributed than investment incomes; the proportion amongst the married of cases where both parties to the marriage are income receivers.

We also note the change in the relative mean difference in the single and married classes when account is taken of the number of children and dependents. With the married, for instance, that group where there is one child and no dependents is entirely different in respect of distribution of incomes from the group with no children and no dependents. Similarly, we note the differences between the various averages in the two classes according to number of children and dependents. In order to emphasise these differences certain percentages are shown in Table IV.

TABLE IV
PERCENTAGE FREQUENCY IN GRADES OF INCOME

Income Grade—	*Single* 0 *children* 0 *dependents*	*Single* 0 *children* 1 *dependent*	*Married* 0 *children* 0 *dependents*	*Married* 1 *child* 0 *dependents*	*Married* 2 *children* 0 *dependents*
£135–	61·0	43·9	24·7	31·5	27·9
£250–	32·4	46·9	52·4	54·2	53·4
£500–	3·7	5·4	11·5	7·5	9·7
£750–	1·2	1·7	4·3	2·8	3·5
£1,000–	0·9	1·1	3·4	2·3	2·9
£1,500–	0·3	0·4	1·4	0·9	1·1
£2,000–	0·5	0·6	2·4	1·0	1·5
	100	100	100	100	100
Numbers (000)	7,755	1,803	3,624	3,153	1,502

These five groups account for 17,837,000 incomes, or about 86 per cent. of the total number of incomes. Sixty-one per cent. of the single incomes with no children or dependents occur in the range £135–£250. In contrast, only 24·7 per cent. of the incomes of the married with no children or dependents are in this income grade. But the percentages of this class in the grades from £500 and upwards are the largest for these five classes. In contrast with this, the married class with one child and no dependents has relatively more incomes in the lowest grade (£135–£250) and in the grade £250–£500, and fewer in the higher income grades.

The point we are anxious to make is that a total group of incomes for the United Kingdom for a given year is made up of a large number of different classes of incomes. When we are able to examine data relating to sub-groups we find that these sub-groups are vastly different in regard to the general level of incomes, denoted by averages, and in regard to variability, denoted by the relative mean difference. The more we probe, the more we are able to emphasise these differences in respect of classes. When we examined data published in the 83rd Report where incomes over £200 for 1937–38 were classified according to source—earned and investment, and the persons were distinguished as single male, single female and married, we had the following figures in Table V.

TABLE V

1937–38. INCOMES OVER £200. MEANS AND RELATIVE MEAN DIFFERENCES

Class of Income		*Single Males*	*Single Females*	*Married*
Wholly Earned	Mean	£278	£274	£289
	Relative Mean Difference	·37	·29	·41
Wholly Investment ..	Mean	£771	£708	£855
	Relative Mean Difference	1·03	·97	1·03
Mixed Earned and Investment	Mean	£697	£544	£675
	Relative Mean Difference	1·08	·95	1·04

The figures in this table are extracted from *Economica*, Feb., 1951, "Distribution of Earned and Investment Incomes in the United Kingdom in 1937–38".

These data related to incomes exceeding £200 in 1937–38, and did not relate to such a large part of the population as the data in the 92nd Report which formed the basis of the major part of the work in this paper. But a glance at Table V shows the difference between the figures for males and females for different classes of income. The general level of incomes is lower for females than for males and the variability is also less. The " married " statistics again are different. Moreover, there are large differences when we take account of the source of the incomes, earned or investment.

The fact that a total group of incomes consists of an aggregate of a number of sub-groups, each with its general level of incomes and variability means that, when comparisons are made over a time period, any change in the composition of the whole group, in respect of the sub-groups, may change the measures such as averages and relative mean differences used to describe the whole group, without there being any fundamental change in the distribution of incomes in the various sub-groups. Without an analysis of the whole distribution of incomes each year which takes account of the distribution in the various constituent classes, it is difficult to assert with confidence that any change in the distribution is due wholly to a change in the distribution of incomes in each class, and not partly to a change in the composition of the whole group.

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Unemployment in Belgium and Full Employment Policy[1]

By W. Robertson

Post-war experience of unemployment in Belgium is of interest for several reasons. First, as one of the few examples of serious unemployment in an industrial country of Western Europe since the war, it offers an opportunity to consider the applicability of full employment techniques in a particular situation. Secondly, it demonstrates the deliberate use of deflationary pressure to bring about structural readjustments. Thirdly, it suggests that a democratic country may tolerate a considerable amount of unemployment rather than carry out a full employment policy, the success of which is assumed to involve measures which tend to "erode" the basis of a free economy. By free economy in this context is meant one in which there are no direct controls over consumption or investment and no direct regulation of commodity or factor prices or the movement of labour. Belgium may be considered to have approximated to this situation during most of the period with which this article is concerned, namely from the beginning of 1948 to the middle of 1950. The article will deal with the unemployment situation in relation to full employment policy, defined as some combination of monetary-fiscal policies and public investment compatible with a free economy. It will be divided into three parts; first, the nature of the unemployment problem; second, employment policy; third, factors determining policy.

I

The development of employment and unemployment in post-war Belgium can be broadly traced from Table I. The first signs of a lapse from full employment appeared before the end of 1947. During the first six months of 1948 the number of wholly unemployed remained below 4 per cent. of the insured working population, but in the fourth quarter of 1948 the upward trend accelerated, raising the level to over 8 per cent. After a further sharp increase during the winter of 1949–50, unemployment declined slowly during the first half of 1950, but even in June it was approximately as high as in the corresponding month of 1949 and more than double the figure for June, 1948. Most Belgian authorities have insisted that these figures of aggregate unemployment were misleading in so far as they included a large number of recipients of unemployment benefit who could be classified as unemployable in varying degrees or who were not genuinely seeking work. From the point of view of policy-making this is a highly relevant consideration. It is part of the general problem of dissecting aggregate unemployment in order to achieve precision in policy. But, allowing for some inflation of the figures, it was generally agreed that they indicated a serious problem of reabsorption, particularly during 1949.

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[1] I am much indebted to Professor L. H. Dupriez and Professor P. Rousseaux for help in collecting data, also to Professor J. W. Nisbet, and to my Liverpool colleagues, for criticism.

TABLE I

Industrial Production, Exports, Employment and Unemployment (1936 – 1938= 100)

Date.	*Industrial Production*	*Industrial Exports (volume)*[1]	*Industrial Employment*[2]	*Average Daily No. of Unemployed (thsnds.)*		*Per cent. of Insured Workers Wholly Unemployed.*
				Wholly Unemployed. (1)	*Partly Unemployed* (2)	
1947 Sept.	95.2	—	112.8	30	6	1.5
Dec.	100.7	—	116.2	57	40	2.8
1948 Mar.	102.3	95	118.1	64	31	3.4
June	96.4	103	117.1	62	43	3.3
Sept.	106.9	98	116.5	81	43	4.2
Dec.	105.6	115	118.1	172	80	8.5
1949 Mar.	109.8	120	115.8	172	65	8.5
June	105.5	126	112.4	159	56	8.0
Sept.	101.8	115	108.7	164	64	8.2
Dec.	105.0	97	107.0	202	63	10.0
1950 Mar.	106.0	116	106.0	191	46	9.5
June	99.0	110	105.0	157	51	8.0
Sept.	117.0	96	106.0	144	26	7.2

Sources: *Monthly Bulletin of Statistics*, United Nations. *Bulletin de l'Institut de Recherches Economiques et Sociales*, Louvain.

Further details of the pattern of unemployment are given in Tables II and III. It will be observed that a considerable deterioration occurred in all the industries listed in 1949. Even those industries which had been only lightly affected in 1948 experienced considerable unemployment, to which must be added short-time working, particularly in textiles and clothing.

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[1] Mainly finished products, forming about two-thirds by value of exports.

[2] Employment in the principal industries.

TABLE II

Industrial Distribution of Wholly Unemployed

(Percentage of insured workers in each industry)

	Sept. 1948	*July 1949*
Building	3.1	5.8
Wood and Furniture	4.5	16.6
Metals	1.4	4.9
Textiles	2.2	6.4
Clothing	1.5	14.1
Leather	5.5	9.2
Diamonds	11.2	41.3
Transport	4.6	10.4

Source: Monthly Bulletin, National Bank of Belgium.

An alarming feature of unemployment was the fairly high incidence among the lower age groups. Table III indicates the pattern by age groups. The concentration in the over-fifties was not surprising, but the failure to absorb young workers reflected seriously on the elasticity of the labour market.

TABLE III

Age Distribution of Wholly Unemployed (percentage of total)

	May 1948	*Nov. 1948*	*May 1949*
Under 20	8.1	10.9	10.4
20—30	19.9	22.7	25.8
30—40	16.1	16.8	17.4
40—50	20.2	20.2	20.2
Over 50	35.7	29.4	26.2

Source: Monthly Bulletin, National Bank of Belgium.

Finally, it should be noted that in May, 1949, more than half the unemployed had been out of work for more than three months, compared with about 40 per cent. during the last quarter of 1948. And over the whole period nearly two-thirds of the unemployed were located in three provinces with less than half the total population.

Industrial production as a whole was well maintained over the whole period, but it showed remarkably little expansion compared with the 1936–1938 average and the performance of other European countries. During the first half of 1949 it exceeded that of the corresponding period of 1948, while unemployment more than doubled. It was particularly noticeable that in a number of industries where output had fallen, for example, textiles and metals, a recovery was not accompanied by a significant decline in their rate of unemployment. This suggests that a considerable amount of rationalisation occurred, a view which is supported by the existence of substantial unemployment in the third quarter of 1950, when industrial production rose to a record post-war level. Rationalisation was partly a response to the difficulties in maintaining or increasing exports, the influence of which on output and employment in an " open " economy like Belgium is of cardinal importance. A rough idea of the extent to which Belgium is dependent on foreign trade can be obtained from the high ratio of exports to national income, estimated at a little under one-third in 1948. The volume of exports continued to rise until the second quarter of 1949, then fell sharply, particularly at the end of the year. It was not until the end of 1950, after the impact of the Korean War, that the earlier export peak was reached and surpassed. Even in 1948 certain industries had a considerable exportable surplus, and in the following year a wide range of export industries were operating to a varying degree below their export capacity and their 1937 export figures. At first, the relatively small foreign demand for glass, cement, rubber and leather products was compensated by exports of iron and steel and chemicals, the demand for which was abnormally high and relatively price-inelastic during the period of extreme shortages. With the ending of these shortages, the export trade of most industries was affected by the revival and expansion of foreign competitors and by discrimination due to the persistent hard-currency problem. The difficulties of entrepreneurs may have been accentuated by the wage-price structure. Prices tended to fall during 1949, especially in the metal and textile industries, but the movement of wages changed only from a relatively rapid rise in the early stage of unemployment to a reduced rate of growth or an insignificant decline as unemployment became more widespread and persistent. Thus entrepreneurs seem to have been squeezed between sagging prices and fairly " sticky " wages. Average wage costs were relatively high compared with other European countries. This was particularly true of the coal industry. It followed that, in trying to maintain their competitive position, Belgian industries had to reduce labour costs by rationalisation, the result of which was a considerable volume of total unemployment among both operatives and administrative staff.

TABLE IV

Wholesale Prices, Retail Prices and Hourly Earnings (1937 = 100)

		Wholesale Prices	*Retail Prices*	*Hourly Earnings*
1948	Mar.	366	389	365
	June	368	393	373
	Sept.	365	399	378
	Dec.	368	391	386
1949	Mar.	350	378	389
	June	339	378	394
	Sept.	334	376	393
	Dec.	338	372	396
1950	Mar.	333	368	398
	June	338	365	404
	Sept.	386	389	410
	Dec.	405	381	427

Source: *International Financial Statistics.*

In conclusion, it may be assumed that to a large extent Belgian unemployment could be attributed to rationalisation and to variations in the volume and pattern of demand for exports. Reabsorption was no doubt impeded by frictions, for there was much geographical and occupational immobility of labour; a high proportion of the unemployed were unskilled; and many were over 50. In so far as these were leading causes of unemployment, Belgian experience may be a pointer to the potential difficulties of other economies highly dependent on foreign trade, especially during a transition from the abnormal pressures of a war or semi-war situation to a more normal structure of production and trade. But frictions on mobility and export difficulties were not solely responsible for the slow reabsorption of the unemployed. In 1949, for example, labour scarcities in certain industries disappeared, and it was no longer arguable that immobility alone prevented labour finding alternative employment. There is a strong presumption that effective domestic demand failed to expand sufficiently, after the elimination of the post-war restocking boom. As will be pointed out in the following section, government policy probably contributed to this lack of effective demand, which was superimposed on the other causes of unemployment.

II

How did the authorities react to the emergence of unemployment? Briefly, their policy tended to induce unemployment in so far as they persisted in the disinflationary pressure which they had begun to apply as early as the beginning of 1946. It is well known that Belgium was the first country to abandon cheap money after the war. In January, 1946, statutory reserve ratios were imposed on the banks, requiring them according to size to hold 65 per cent., 60 per cent. or 50 per cent. of their assets in the form of government securities or cash. The result was a persistent scarcity of bank credit and a marked upward pressure on interest rates. These restrictions on bank credit expansion were supplemented by increases in the Central Bank's discount rate raising it from 1½ to 3½ per cent. Originally, a restrictive credit policy had been designed to check a potential inflationary expansion of credit to the private sector during the post-war phase of full or over-full employment. It remained in operation without modification until October, 1949, but with the additional objective of stimulating readjustments in the pattern of production. Even at that date the reserve ratios were only slightly modified and bank rate cautiously reduced by ¼ per cent. The monetary authorities seem to have attributed the growth of unemployment in various industries primarily to the gradual elimination of distortions arising from the post-war boom. Since maladjustments between the pattern of demand and the structure of production were not apparently accompanied by any indications of a decline in aggregate effective demand, at least during 1948, it was argued that measures to expand effective demand, far from being appropriate, would actually slow up the process of readjustment. For this reason deflationary pressure through banking policy was maintained in order to accelerate rationalisation of production and to induce the appropriate shifts of resources. This attitude remained a dominant feature of policy, although it became increasingly obvious that the reabsorption of redundant labour would probably involve measures to stimulate effective demand as well as to assist structural changes and to reduce frictions.

A deflationary monetary policy no doubt had a considerable measure of success in compelling entrepreneurs to accelerate an inevitable reorganisation, particularly when it was combined with " sticky " wages. As each industry or group of industries encountered an inadequate demand, domestic or foreign, it felt the pressure of these twin forces, and in order to hold markets was forced to introduce labour-saving technological and organisational innovations. Against this method of bringing about readjustments, it may be contended that deflationary pressure tends to be a clumsy and inadequate approach, especially if the necessary readjustments are large and if resources are likely to be sluggish. It inevitably involved hardship to labour, or at least to redundant workers, although the edge of this objection is partly blunted by comparatively generous unemployment compensation of unlimited duration. (Unemployment benefit in Belgium is basically half the unskilled worker's wage.) It could not overcome the difficult problem of labour immobility ; and the use of the financial pressure of unemployment to induce mobility is not readily acceptable to many people. Another serious criticism is that, in so far as the reabsorption of the unemployed required the growth of new or the expansion of old industries, constant deflationary pressure had a depressing effect. Admittedly, the dear money policy may not have acted as a sufficient deterrent to investments of short maturity, but it probably operated to the disadvantage of large-scale investments which required a considerable time to mature, and it checked reconstruction in such essential industries as coal-mining and railway transport. It may also be reasonable to doubt whether the nature of the necessary readjustments was not underestimated. This was the conclusion of the E.C.A. Mission, which argued strongly that substantial revision was needed in official forecasts of the most desirable orientation of capital investment.[1]

Fiscal policy exhibited a similar reluctance to resort to expansionary techniques whenever more than " normal " unemployment appeared. Large-scale borrowing from the Central Bank to finance budget deficits was stopped at the end of 1946, in accordance with the government's determination to avoid inflationary financing, even although this might involve " the discontinuance of politically useful expenditures ". Statutory restrictions were imposed on the volume of Central Bank credit available jointly to public and semi-public authorities. Paradoxically, the Treasury ran a large deficit on the ordinary budget in 1947, the last year of full employment. In 1948, on the other hand, the ordinary budget yielded a small surplus, and in 1949 there was only a small deficit. Fiscal policy was apparently being operated in the opposite sense to the technique of imposing high taxation in boom years and running a deficit in depression

[1] " Belgium and Luxemburg : A Country Study," *E.C.A.*, Feb. 1949, p. 61.

years. It may be conceded that there were difficulties (of time, temperament, administrative expediency) in accumulating a surplus in the immediate post-war years. Even under normal conditions this kind of counter-depression policy has not yet been fully implemented by any country. *Prima facie*, however, the government was simply committing the old error of increasing economic instability by accentuating the tendency towards depression once the symptoms had appeared.

At least until the end of 1949 public investment remained at a relatively low level compared with neighbouring countries and reasonable long-term needs. The original rationale of this policy was to avoid competing with the private sector for scarce capital and labour resources. And in so far as the relevant forms of expenditure were postponable without positive disadvantage in the short run, this policy had much to recommend it. It was continued into the period of unemployment. In 1948 a substantial cut was made in the capital budget because of the difficulty in raising funds to finance the original programme of public investment. Public investment fell below what was officially considered reasonably necessary for long-term needs. During the first nine months of 1949 public borrowing remained at a low level, but in October the Treasury floated a large medium-term loan. Towards the end of 1949 an expanded public works programme entered its first stage, designed ultimately to employ 70–80,000 workers, directly or indirectly, excluding the secondary reaction on employment. It is reasonable to suppose that it was partly responsible for the decline in unemployment during 1950, but probably the main impact had not been experienced before the complications of the Korean war, which stimulated output and employment in a number of industries and created difficulties for the public works programme in terms of both financial and real resources. It is impossible, therefore, to estimate precisely to what extent the programme would ultimately have influenced employment.

Summing up, there was a marked reluctance to use any of the well known expansionary techniques until the unemployment problem had apparently become chronic and until a sharp slump in exports actually began to generate serious multiplier effects on domestic income and employment. At that stage it was quite evident that there was a lack of effective domestic demand, in the sense that demand was not expanding at a rate commensurate with rising productivity. It followed that either domestic or export demand, or both, had to be raised and that a marked reversal of post-war policy was necessary. The major element in the new expansionary policy was destined to be the public works programme, an approach usually regarded as a " stop-gap " and unsatisfactory from the point of view of structural readjustments. The rest of this article will be directed to a discussion of the leading factors limiting a more determined and a prompter recourse to full employment techniques on a comprehensive scale.

III

Full employment policy, as interpreted here, offers three lines of approach to unemployment arising from a lack of effective demand—a reduction in interest rates and an increase in the supply of money through banking policy, an expansion of investment in the public sector, and a variety of fiscal expedients. In policy-making, however, a distinction must be drawn between " conjunctural " unemployment and that arising from structural changes and prolonged by frictions on mobility. While the former was certainly a constituent of the general problem, particularly in 1949, unemployment from these other causes was at least as significant. Even when industrial production and exports reached record post-war levels in the last few months of 1950, and domestic consumption was swollen by the impact of the Korean War, unemployment remained between 8 per cent. and 9 per cent.—at a period normally characterised by a seasonal decline. An approach to the structural aspect of the problem could probably have been based partly on the E.C.E. suggestion of direct assistance to particular industries ; for example, by subsidies, guarantees on loans, or loans on special terms. Such measures were potentially useful in industries, the capital equipment of which recognisably required drastic modernisation, or the expansion of which seemed desirable for the long-term needs of the economy as a whole, as well as for the short-term reabsorption of the unemployed.

Why did Belgium tolerate a substantial lapse from full employment for several years ? Fundamentally, the explanation seems to be that the dominant political, economic and social objective was not " continuous full-employment and nothing else ". If this view is accepted, then the " climate of opinion " in Belgium must be taken into account as a vital determinant of the range of full-employment techniques open to the government. In Britain, so far, the over-riding objective may be assumed to be full employment. The claim of many economists to have " discovered " the secret of the problem of unemployment, as Sir H. Henderson points out, was " readily accepted at its face value by a wishful-thinking public during the war years and received some measure of official endorsement in the White Paper on Employment Policy ".[1] Thus the conviction that the government can do something about unemployment and the emphasis on full employment in political reasoning at all levels have created the impression that large-scale unemployment would herald drastic political repercussions within a very short time. Whether this hypothesis is justified remains to be seen.

In Belgium the government had indeed made a " formal commitment to employ all means within its power to combat unemployment and to ensure the highest possible level of employment "[2]; no doubt there were also pressure groups acutely concerned about unemployment. However, the concept of full employment shared the field with three other objectives ; first, the avoidance of a " true " or " semi-" inflation (in the Keynesian sense) ; second, a minimum of state interference ; third, a balance in the country's external accounts. The attitude of dominant sections of public opinion towards the priority which full employment should receive was strongly influenced by an acute sensitivity to inflation. Even if only a " semi-" inflation were expected from an expansionary policy, it would probably have been dangerous to assume that this would not induce some loss of confidence in government policy, particularly if there were any doubts about the financing of the expansion, or if the expectation grew that the increase in prices might become general. If it had been possible to supplement full employment policy with direct controls, it is reasonable to suppose that a considerable impression could have been made on unemployment even in the short run. But if a "forced draught" of controlled inflation is the price of full employment, it is essential that the "climate of opinion" should be favourable or at least not actively hostile. The technique of direct controls seems to be reasonably successful only if the principle and much of the practice is generally acceptable, or if the controls are manipulated by an authoritarian government. A controlled inflation does not appear to have been practical politics in Belgium. It is possible that the authorities may have been unduly cautious or pessimistic in their assessment of the immediate practical value of full employment techniques. It is difficult for an external observer to form a precise judgment, but it is desirable to avoid generalising on the basis of post-war British experience or of hypotheses of the future trend of opinion in Britain.

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[1] " The Function of Exchange Rates ", p. 10, *Oxford Economic Papers*, New Series, Vol. I, No. 1, Jan. 1949.

[2] United Nations, *Maintenance of Full Employment*, p. 80.

There may have been some scepticism whether, given the utility and practicability of loans or tax rebates to particular industries, they would have been sufficient in themselves. Was a system of direct controls a necessary supplement? Was some regulation of investment necessary to iron out structural defects as well as to even out the instability of investment as a whole? One may hazard the guess that to achieve large readjustments without permitting unemployment to rise above 5 per cent. or to remain for long above 5 per cent. would have required more direct government interference than was generally acceptable. State control might have been inevitable over industrial location, the direction of investment, perhaps over prices and wages. The issue seems to be of general interest for what may well be a recurrent aspect of the pattern of post-war unemployment, in the "open" economy. In so far as an "open" economy is subjected to changes in demand or in technology, it will probably be extremely difficult to keep structural unemployment down to a level consistent with a continuously high full employment "target" without using techniques exceeding those we have subsumed under full employment policy. Under these circumstances, a great deal depends on the relationship between the objective of full employment and other competing objectives.

The difficulties of a domestic expansionary policy were, of course, accentuated by the fact that Belgium is essentially a small "open" economy highly vulnerable to changes in the volume and pattern of its exports, and limited in full employment policy by the potential impact on the balance of payments. Under these circumstances, as Sir Hubert Henderson has pointed out, " generalisations and prescriptions of policy suggested by theoretical analysis proceeding on the basis of a ' closed ' economy are apt to be dangerously out of focus ".[1] Remedies for unemployment must obviously take account of qualifications introduced by the abandonment of the premiss of a " closed " economy. As is well known, a domestic expansion will react on the balance of payments through the import leakage, the possible diversion of resources from export industries, the effects on wages and prices and possibly on capital movements. If the expansion were to involve financial measures which were suspect to investors, there might be an export of capital or the cessation of a capital import, accentuating a disequilibrium in the trade balance. While steps can be taken to prevent a flight of capital, leakages are liable to occur, and to enforce the repatriation of income earned abroad implies a less palatable form of control, particularly in a country apparently allergic to controls.

Given the need to expand investment in both the private and public sectors, the crucial problem consisted in bringing savings and investment into equilibrium at the level of full, but not over-full, employment. The problem was complicated by the high, if indeterminate, proportion of voluntary savings taking the form of bank-notes, normally attributable to tax evasion and custom, but now accentuated by the influence on liquidity preference of a cautious appraisal of the prospects of future inflation. The government was acutely aware that a large volume of savings was " sterilised as the result of lack of confidence " ; and this seems to have limited its freedom of action both in monetary and fiscal policy. Originally it had argued that " the fact that the authorities have not so far had resort to a cheap money policy, means that there is freedom to manœuvre . . . "[2] But when the growth of unemployment in one sense pointed to a relaxation of credit policy, the monetary authorities feared that an expansion of bank credit might exceed the limit up to which an increase in net private investment could be financed out of new voluntary savings, or that a switch in bank holdings of government securities to other assets would embarrass the Treasury by compelling it to find additional funds to meet maturing Treasury certificates. It was the latter situation which the banking legislation of January, 1946, had partly been designed to prevent.

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[1] " The Function of Exchange Rates ", p. 10, *Oxford Economic Papers*, Vol. I, No. 1.

[2] United Nations, *The Maintenance of Full Employment*, July 1949, p. 84.

The lack of voluntary savings, or " productive " savings as it was termed, was equally a limiting factor to a substantial increase in the extraordinary or " capital " budget. If the public authorities could have borrowed from the market to finance a larger capital budget, without reducing the flow of funds into private investment, a non-inflationary expansion of overall investment was possible, assuming that the supply of labour was elastic. Until the fourth quarter of 1949, the government evidently did not believe that it could expand its own investment programme without curtailing investment in the private sector. Therefore, as long as it assumed that this situation persisted, it hesitated to restore the cuts of 1948 or to raise the public works programme beyond the original 1948 level. It followed that, even as a stop-gap measure, public investment could not be stepped up in the early stage of unemployment. Although a second-rate expedient so far as structure maladjustments were concerned, it was unfortunate that public works could not be expanded, quite apart from their potential value in stimulating income and employment, because the postponement of many of the major projects contemplated since the war had left a large " backlog " of essential public investment. Thus an expansion of public works was defensible on the grounds that the distribution of resources between public and private investment had fallen below what might be termed an " optimum " division. For both a long-term equilibrium division of resources between the two sectors and for a higher level of employment in the short period, an increase in public investment was probably desirable, provided it did not impede readjustments or reduce net investment in the private sector.

What scope was there for the use of the fiscal mechanism to compensate for a shortage of voluntary savings ? The E.C.A. Mission took a sceptical view of the utility of the tax system at least in counteracting a lack of effective demand by tapping additional funds for investment purposes. " If the Belgian government has been unable to produce a surplus in the current boom period the present tax system may be even more inadequate to make revenue available for investment if there is a deflation."[1] While contemplating a fiscal reform in 1948 or 1949, the government was chary of readjustments in the fiscal system. In so far as unemployment at first was not attributable to a lack of effective demand, it was reasonable to avoid reducing the tax burden on the lower income groups. Even later, when aggregate demand might have been expanded, it would have been necessary to cover tax remissions to some groups by higher taxation of upper income groups in order to balance the budget, at a higher level of government expenditure. A balanced budget was regarded as a *sine qua non* of confidence, " an essential prerequisite from the point of view of promoting ' productive' saving ".[2] Higher taxation of upper income groups might have compensated for under-saving, but this was no easy solution, given the political difficulties, fiscal evasion, or loss of incentive to save on the part of those adversely affected. If it could have been assumed, however, that these obstacles were not insurmountable, then this method of redistributing the tax burden and compensating for under-saving was a possible solution.

It might be argued, of course, that deficit financing was permissible if the public could be relied upon to continue hoarding. Cash hoards represented an interest-free loan to the Treasury. On the assumption, therefore, that the public was prepared to continue adding to its cash holdings, a non-inflationary budget deficit, or a non-inflationary expansion of bank credit, was practicable. The weakness of this argument seems to lie in the assumed complementarity of deficit financing and hoarding. Despite the element of custom, the holding of large cash balances was essentially unstable, especially in post-war conditions with a public acutely attuned to the inflationary possibilities of deficit financing of government expenditure. Thus the instability of the propensity to hoard bank-notes rendered an increase in the money supply as a means of inducing an expansion a gamble with the odds against the government. It was clearly a risk which the authorities were not prepared to run.

It was also quite clear that a change had to be produced in the proportion in which the community wished to divide its income between consumption and investment, while the element of hoarding in voluntary saving had to be reduced. And this change had to be such that the new allocation of income was the same as the proportion in which resources devoted to consumption and investment output would be fully employed. In their approach to this problem it is possible that the authorities did not pay sufficient attention to the technique of varying the rate of voluntary savings by suitable propaganda and by various incentives. But the imponderables weighing against an upward shift in the propensity to save were comparatively strong, and, in addition, it was not easy to reverse a post-war policy which had been markedly orientated towards a high rate of consumption. If no significant change could be expected in the pattern of savings and consumption, then considerable difficulty was likely to arise if an attempt were made to expand investment. In so far as the absorption of the unemployed required readjustments in the structure of production—and these readjustments involved forms of investment which could give returns only in the long run—the increase in the supply of goods and services would necessarily lag behind the increase in effective demand resulting from the higher aggregate income. This time-lag would be the longer and the gap the greater, the higher the proportion of new investment which took a long time to mature. There would, therefore, be a critical transitional phase during which inflationary pressure would occur unless relieved by direct controls, or by an increase in private savings, tax yields, or imports financed by external borrowing.

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[1] " Belgium and Luxemburg: A Country Study," *E.C.A.*, Feb. 1949, p. 50.

[2] United Nations, *Maintenance of Full Employment*, Belgian reply to Question 7, p. 83.

It could be objected, of course, that the existence of surplus capacity and unemployed labour implied that an expansion of income and employment could proceed for some time without increases in factor and commodity prices. Theoretically, under certain conditions, an expansion financed by bank credit will have no effect on prices so long as there are unused resources ; and " true " inflation will arise " only when a further increase in the quantity of effective demand produces no further increase in output and entirely spends itself on an increase in the cost-unit fully proportionate to the increase in effective demand ".[1] This argument depends, as was explicitly pointed out,[2] on elasticity in the supply of factors of production. Where labour is perfectly mobile and interchangeable without loss of efficiency, wages and prices need not rise. But if this assumption is unjustified, there is the risk of price increases even at the beginning of an expansion, direct controls at strategic points being ruled out. In Belgium, there were doubts about the duration of an expansion without a cumulative upward movement in factor prices. There was considerable scepticism about the geographical and occupational mobility of labour and doubts about its efficiency in alternative occupations.[1] It does not follow that these objections would hold in the long run, given appropriate schemes for re-training labour and locating new industries. But it is likely, as the authorities feared, that the point at which factor prices would begin to rise would lie well above an unemployment rate of 3—5 per cent. In building, for example, " black " wages were reported even before the end of 1949.[2] The index of hourly earnings in manufactures rose by eight points in the first half of 1950 and 23 points in the second half, compared with ten points in the previous year. These were indications of the upward elasticity of wages in response to increasing demand and a pointer to the possible effects of an attempt to reach too quickly a high full employment " target ".

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[1] J. M. Keynes, *The General Theory of Employment, Interest, and Money*, p. 303.

[2] *Op. cit.*, p. 300.

IV

The conclusions which emerge from Belgian experience of unemployment seem to be highly relevant to the contemporary controvery on the maintenance of full employment. First, it illustrates acutely the difficulty of financing a non-inflationary expansion of investment when there is a persistent tendency to save voluntarily less than is required to bring savings and investment into equilibrium at the full employment level, even if this is not narrowly interpreted. The Belgian situation, of course, was further complicated by the sensitivity of public opinion to what were considered traditional pointers to inflation—a large budget deficit, Central Bank financing of government expenditure, and devaluation of the franc. The determination to avoid these remedies for unemployment strongly influenced employment policy. The alternatives, a relaxation of credit restrictions and public investment, were severely limited by the trend of savings. It does not follow, however, that the full employment techniques postulated at the beginning of this paper were invalid. Unemployment arising from a deficiency of effective demand and from structural causes was amenable to these techniques, provided they were supplemented by controls. In the short run, therefore, the alternatives were full employment and controls, or unemployment and freedom from controls. Some divergence from a free economy was inevitable if full employment were to be maintained without "active" inflationary pressure.

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[1] Cf. *Bulletin de l'Institut de Recherches Economiques et Sociales*, Louvain, May 1950, p. 198.

[2] *Op. cit.*, p. 199.

Secondly, the time-lag between the lapse from full employment and the first serious steps to restore it by government action, together with the antipathy to government intervention, suggests that in a world of varying systems, even within the general democratic framework, discrepancies in the interpretation of and approach to full employment may wreck an international approach to unemployment. The clash of ideas during the discussion on the Report of the Group of Experts in the United Nations Economic and Employment Commission is a further pointer in that direction.[1]

Thirdly, the successful application of full employment techniques seems to presuppose a favourable "climate of opinion". This underlying assumption is sometimes overlooked. In so far as it is a political factor, this omission may appear justifiable to some, but it reduces the practical value of policies based on the theory of employment under the conditions described in this paper. The pressure to use these techniques, however, may be reduced if there are other leading objectives besides full employment. The attitude of dominant sectors of public opinion may crystallise in such a way that a higher rate of unemployment may become acceptable than at present seems possible in some countries. This seems to have happened in Belgium. It is not impossible that a similar development may occur in countries which in recent years have maintained the state of full employment from which Belgium lapsed in 1947. If this is a reasonable assumption, then "traces of backsliding" in relation to the principle of full employment simply reflect a change in the "climate of opinion". The outcome of this development will probably be settled in the political field, and will depend on the relative strength and behaviour of economic and political groups.

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[1] Cf. Synopsis in *International Labour Review*, April 1950, pp. 385-409.

Cost Curves for Electricity Generation

By K. S. Lomax

A problem of some interest and importance is the variation in cost per unit of electricity generation for different sizes of plant. Cross-sectional data, of the kind used here, relating to costs in different generating stations at the same time, when graphed, will give a rough approximation to the long-run cost curve, that is, the envelope of the short-run cost curves for individual stations. Strictly, of course, it cannot be assumed that undertakings are operating at the minima of their short-run curves. Particularly is this true when the commodity is in short supply and produced by local monopolies.

The first point is the different meanings to be attached to the term " cost ". Prior to nationalisation, the Electricity Commission and, later, the Ministry of Fuel and Power, published information on *works cost of generation* which includes fuel, salaries and wages of generating station staff, maintenance and repairs. No separate information about such generation overheads as management expenses, interest charges, and depreciation provision or sinking fund payments was provided. Examination of data, however, in a small sample of complete local authority accounts suggests that these other items behave in a manner not significantly dissimilar from works cost, so perhaps the inevitable concentration on the latter is not without justification on grounds other than availability of the statistics.

Next is the fact that there are several different systems of generation. In 1947, the last year for which the Ministry of Fuel and Power reported, in 202 of 334 stations operating the prime-mover was a steam engine, in eighty-two an oil engine, and forty were driven by water-power. On the criterion of size the predominance of steam generation was even more marked. The steam stations accounted for 96.9 per cent. of the total units generated, while 2.81 per cent were generated by water-power. It is thus reasonable, in examining costs, to concentrate on the dominant type—

steam stations. Even then the data will not be completely homogeneous.

In the first place the boilers in steam stations may be coal-, coke-, or oil-fired. However, in the year 1947-48 only 25,700 tons of oil were used for boiler firing compared with 26,146,677 tons of coal and coke. Secondly, stations will differ considerably in the time when they were built, which would be expected to affect costs, particularly, but not only, capital charges. In the P.E.P. Report on the Electricity Supply Industry, though, it is stated that (in 1936) almost three-quarters of all generating plant in public supply stations was represented by comparatively new units. Thus although, unfortunately, little can reasonably be done about this matter there is reason to hope, electricity supply being relatively a new industry, that the effect will not be too serious. This is made the more likely by concentration in the following analysis on stations with similar types of generator (A.C. on a frequency of 50 cycles per second), which automatically excludes many of the older stations operating with D.C. generators.

Thirdly, the level of prices, wages, salaries, etc. will vary in different parts of the country. This is particularly true of coal, which is supremely important here. Efficiency, too, might be higher in some regions than in others, so that we cannot include in the same analysis generating stations in different parts of the country. Two regions, the North-West and the South-East, are considered.

Fourthly, it seems desirable to exclude stations operating intermittently for comparatively short periods. Unfortunately, actual generating times are not published but stations are classified A, B, C and D on the basis of hours of generation. " A " stations generate continuously for the whole year of 8,760 hours; " B " stations operate for between 6,600 and 8,760 hours, and " C " for 2,400 to 5,900, both including banking with a minimum of 2,400 running hours. " D " stations generate only for less than 2,400 hours. The analysis is restricted to " A " and " B" stations. This does reduce the sample size somewhat but, because of the fine breakdown necessary in any case, to achieve homogeneity, only a little. Further, there is ample size variation even within the " A " and " B " categories.

Finally, the character of the load on a station would be expected to produce differences in unit cost. The lower will be the cost the more uniform is the demand. Stations with large industrial demands to fill in the troughs in the load curve will be more economical. This can be taken care of by including in the analysis, for each station, the load factor, the ratio between the average load taken over the whole year of 8,760 hours and the peak demand. Inclusion of the load factor will also, to some extent, eliminate such differences in generation hours as exist in the " A " and " B " categories.

It is most important in investigating the laws of true returns to scale ("true" in the sense of being free from all influences save that of scale) for electricity generation to be able to allow for varying load factor because there is a natural tendency in big undertakings with large numbers of consumers for irregularities in demand to be smoothed out to some extent and the load factor improved. Then again, large stations will have a proportionately bigger industrial demand, which will also facilitate more continuous generation.

With these qualifications, then, the variation of costs per unit with size of undertaking is investigated. Size of station is most conveniently represented by capacity of generating equipment in kilowatts. The method adopted is to calculate the regression of costs per unit on capacity and load factor for " A " and " B " steam stations, with A.C. generators operating on a frequency of 50 cycles per second, in the North-West and South-East respectively. Functions linear in the logarithms are found to be the most satisfactory. Thus if, in 1947–48, the latest year for which data are available—

Y = Costs per unit generated, in pence
X_1 = Capacity of generators in kilowatts
X_2 = Load factor

North-West $Y \propto X_1^{-0.12} \quad X_2^{-0.41}$
South-East $Y \propto X_1^{-0.15} \quad X_2^{-0.70}$

These relationships mean that, on the average, if the load factor were held constant, an increase in size of station by, say, 10 per cent. would result in a reduction of cost per unit by about 1·2 or 1·5 per cent.

The differences between the two regions are probably due to sampling errors, the numbers in the samples being, unfortunately, small—fifteen in the North-West and twenty-two in the South-East. It should be pointed out, furthermore, that the two independent variables being highly correlated it is very difficult, statistically, to separate out their respective effects. Too much reliance should not therefore, be placed on the precise magnitude of the parameters.

Actual figures given by the above equations would, nevertheless, be of interest.

TABLE 1.

COST PER UNIT IN NORTH-WEST "A" AND "B" STATIONS

(A.C. Generators on frequency of 50 cycles/sec.)

Load Factor Capacity	20 per cent.	30 per cent.	40 per cent.	50 per cent.
25,000 kw.	0.73d.	0.62d.	0.55d.	0.50d.
50,000	0.67	0.57	0.50	0.46
100,000	0.62	0.52	0.46	0.42
150,000	0.59	0.50	0.44	0.40
200,000	0.57	0.48	0.43	0.39
300,000	0.54	0.46	0.41	0.37

TABLE 2.

COSTS PER UNIT IN SOUTH-EAST "A" AND "B" STATIONS.

(A.C. Generators on frequency of 50 cycles/sec.)

Load Factor Capacity	20 per cent.	30 per cent.	40 per cent.	50 per cent.
25,000 kw.	1.00d.	0.75d.	0.61d.	0.52d.
50,000	0.90	0.67	0.55	0.47
100,000	0.81	0.61	0.49	0.42
150,000	0.76	0.57	0.46	0.40
200,000	0.72	0.54	0.44	0.38
300,000	0.68	0.51	0.42	0.36

Both tables are extrapolated, to some extent, beyond the range of the data on which the equations were based. Figures in the vicinity of the leading diagonal from top left to bottom right will be the most reliable. It is observed that, as expected, costs tend to be rather higher in the South-East than in the North-West. The differences between the two areas become very small, however, at high load factors.

Any column in the above tables exhibits the familiar increasing returns to scale of operation in an undistorted form, the effects of variation in load factor having been eliminated. The results for different load factors in the same station can be traced along the rows. The economies of size for a constant load factor are due, for example, to reduced labour costs per unit, lower fuel consumption per unit generated, greater flexibility of operation associated with larger numbers of generating sets, and the lower costs of repair and maintenance. This rate of decrease in costs as size increases for unchanged load factor is probably less than would be generally expected. The big undertakings in this country have the high load factors and long hours of generation so that actual costs in large stations are appreciably lower than size alone would imply. Concentration of production in large undertakings, which reaps the benefits of economies attributable to both high load factors and capacity, should be one of the principal benefits accruing from nationalisation of the industry and development of the grid system. On the other hand, there is the danger in integration of transmission losses and diseconomies of distribution. Furthermore, if the British Electricity Authority's declared policy of providing equipment sufficient to meet unrestricted demand even at the peak is implemented, load factors will fall, with possibly serious effects on cost. It has been seen that the load factor has a most material influence on costs per unit generated.

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Book Reviews

Léon Walras, Fondateur de la Politique Économique Scientifique. By MARCEL BOSON Librairie Générale de Droit et de Jurisprudence, Paris, Lausanne. 1951. xi + 381 pp.

The title M. Boson has given to this detailed and extensive study is a very challenging one. Still more challenging is the statement in the Preface, by M. Oulès, the present occupant of the chair at Lausanne, that Walras' "most profound and fertile idea is his scientific conception of economic policy". Much justification for M. Boson's title is assembled in this book, which renders a very valuable service in emphasising the importance of a much-neglected section of Walras' work, which was of primary importance to the Maître himself. That Walras' contributions to pure analysis belong among the two or three greatest ever made has gradually received wide recognition, thanks especially to Schumpeter. But Walras was above all an enthusiastic French radical reformer, who seems to have believed that enlightened doctrines of economic policy could be derived with logical directness from his pure analysis, and it was this "scientific conception of economic policy" which inspired and unified his life-work.

A main reason for the neglect of Walras' writings on policy is that, like Menger and Marshall, he never completed his life-work as he first planned it, though (unlike Marshall) he never seems to have hesitated or shifted his plans. What were to be the second and third volumes of a three-volume whole, were put together towards the end of his life out of papers and lectures delivered over three or four decades. One of these volumes was devoted to the *distributional* side of economic policy, and the other to the *production* side, and though they were never systematically completed and unified, they are quite sufficient to show the plan and many of the details of Walras' system of "welfare" economics.

Another reason for the neglect of Walras' writings on economic policy may well be found in the quite misleading prominence—for which he himself is largely responsible—given to the trivial or erroneous proposition in his *Elements* about how the maximum social satisfaction is produced by competitive conditions. The attempt at a mathematical proof of this rigmarole had been the subject of his first essay in pure analysis and he never withdrew it. But this proposition is virtually, though not formally, disregarded or superseded in his two comprehensive volumes showing how competition must be organised, supplemented, or replaced, on the side first of distribution and then of production.

The volume on distribution is concerned mainly with the property framework of society, and its principal detailed proposal is a fiscal attack on private property in land and eventually its nationalisation. On the side of production, Walras advocated : (i) state control of monetary policy and institutions for the urgent purpose of monetary reform and stabilisation ; (ii) state responsibility for goods and services where requirements cannot be adequately assessed individually (e.g. education and defence) ; (iii) state regulation, though not necessarily operation, of natural monopolies and public utilities, and perhaps of any industry where increasing returns make competition self-destructive ; (iv) state regulation of speculation and of hours of work.

Walras outlined a liberal-socialist system combining central responsibility with extensive use of the price-mechanism and a vigorous respect for individualist self-help. As well as by supplying the theoretical basis with his general equilibrium analysis, Walras pointed the way to those blue-prints of a socialised price-mechanism of which Barone was later to give a more detailed theoretical outline. Walras emphatically distinguished his " liberal ", " synthetic ", or " scientific " socialism, as he variously called it, from Marxian socialism which, with its labour theory of value, possessed no adequate principles for the guidance of production : " Marxism still has to tell us how, under its system, an equilibrium of demand and supply for each product is brought about . . . . How is the State to set about its task, in complete ignorance of the quantities that should be produced ? Certainly, economists have never demonstrated scientifically the principles of free competition. Fortunately for them, free competition organises production more or less well. In going into ecstasies over the admirable manner in which it does this they regard their task as accomplished. But socialists must proceed differently. They must mark themselves off from ' economism ' above all in their knowledge of political economy. And they must explain why and how this or that principle will lead to and maintain equilibrium in the demand and supply of goods and services. In doing this they will advance from the literary to the scientific stage. This is what Marx's collectivism fails to do." Walras distinguished his form of socialism from the Marxian form by its free market for labour—while urging protective measures by the State for the (then) weaker side in the labour market.

M. Boson gives a very careful and valuably documented treatment of his subject. Much use is made of unpublished or comparatively inaccessible letters and papers. He examines at length the main early influences on Walras' thinking and the section on Auguste Walras is most useful. Some parts may perhaps be found over-extensive. For example, on the subject of the " Actualité de la pensée fondamentale de L.Walras " (Ch. IX), the section on the doctrines of "Keynes et les Keynesiens ", Beveridge, and J. E. Meade, hardly seems to be closely relevant. Except perhaps for some indirect traces of Walrasian thought in " Planning and the Price Mechanism " all that the doctrines of these English authorities have in common with those of Walras is the advocacy of a mixed economy.

T. W. Hutchison.

Principles of Economics. By Carl Menger. Translated and Edited by James Dingwall and Bert. F. Hoselitz. The Free Press, Glencoe, Illinois. 1950. 328 pp. $5.

Messrs J. Dingwall and B. F. Hoselitz have rendered a most arduous and valuable service in producing an English version of Carl Menger's *Grundsätze* (from the edition of 1871). They are fully justified in emphasising the difficulties of translation imposed by Menger's prose style. They had to face, in an especially acute form, the dilemma which most translators—(particularly perhaps from the German)—have in some measure to face: that of choosing between trying to promote a spare and lucid readability, or, on the other hand, of keeping faithfully close to the original and trying to preserve something of its flavour and thought-processes. They have justifiably tended to choose the latter alternative and to keep close to the original, without always being able to achieve an exact reproduction.

The translators trace the involved ponderosity of Menger's style to his early years in the Civil Service (Ministerratspräsidium) and to "the heavy officialese current in his day among Austrian Civil Servants". Certainly, blended with the atmosphere of Teutonic ratiocination, there is traceable something of an old-time Whitehall aroma, before the advent of Sir Ernest Gowers. Here, for example, is the famous paragraph in which Menger stated his marginal utility proposition :—

" Accordingly, in every concrete case, of all the satisfactions secured by means of the whole quantity of a good at the disposal of an economizing individual, only those that have the least importance to him are dependent on the availability of a given portion of the whole quantity. Hence the value to this person of any portion of the whole available quantity of the good is equal to the importance to him of the satisfactions of least importance among those assured by the whole quantity and achieved with an equal portion." (All this of course is in one sentence, not two, in the German original.)

Here again, is Menger (comparatively very briefly) on complementarity :—

" The additional complexity arising with goods of higher than second order lies rather in the fact that even command of all the goods required for the production of a good of the next lower order does not necessarily establish their goods-character unless men also have command of all their complementary goods of this next and of all still lower orders."

Readers of this English version, as they chew their way through such mouthfuls, must restrain or redirect any feelings of vexation with Messrs. Dingwall and Hoselitz, who have done what they reasonably could by slight modifications to present an English version rather less indigestible than a more literal translation would have been. If they had tried to lighten the style any further they would probably have failed to convey an adequate idea of the thought-processes of their author. Menger's *Grundsätze* as written by Sir Ernest Gowers, would not be Menger's *Grundsätze*.

T. W. Hutchison.

Industrial Research in Switzerland. By Ronald S. Edwards in collaboration with Charles La Roche. Pitman. 1950. 111 pp. 21s.

Professor Edwards and his collaborator have given us a lucid and well-proportioned description of the organisation of industrial research and development in Switzerland, and at the same time they have told us many useful things about the Swiss economy as a whole. The interest of the English reader in this book is enhanced because Professor Edwards has had his eye on the lessons that we should draw from Swiss experience, and so he has provided us with some illuminating comparisons between the Swiss and British ways of handling the same problems. Of late years we have sought to take our lessons in industrial efficiency too exclusively from the United States. Professor Edwards makes the point that in many respects the Swiss economic problem is more closely akin to ours than is the American, for Switzerland, with meagre natural resources, has to find her living mainly by selling the products of her industry to the outside world. These products are not mass-produced goods, but are, for the most part, specialities of high quality.

The scope of the book is rather wider than the title suggests. Professor Edwards begins with a useful sketch of the industrial structure of Switzerland before considering the question of the expenditure on research of the main branches of industry. From this he passes to an examination of the Swiss Universities and their relations with industry, with special reference to their work in applied science and technology. He then discusses methods of co-operative research. We learn that "co-operative research organised through institutions has not gone very far in Switzerland" and that the individualistic Swiss doubt the value of the kind of co-operative industrial research which has developed in England. Finally, there are brief accounts of the part of the State in sponsoring research, of taxation in relation to research, and of the patent system.

The general conclusion is that "with the exception of Universities, Great Britain is more lavishly endowed with establishments conducting research of direct importance to industry than is Switzerland, and that the British Government spends more per head of population in support of them than the Swiss Government ". Further, there is no evidence to suggest that " Swiss industry is, in general, ahead of British industry in research investment . . ." The explanation of the remarkable achievements of Swiss industry in the world's markets, despite many natural obstacles, must be sought in other directions. Professor Edwards finds part of the explanation in the Swiss educational system, which seems to have been very successful in turning out large numbers of well-trained scientists and technicians for industrial employment. For the rest the Swiss believe in, and practise, the Victorian virtues of thrift, self-help and hard work.

G. C. Allen.

Inflation and Expansion. Essays on the Australian Economy. By Sir Douglas Copland. F.W. Cheshire, Melbourne. 1951. 130 pp. 14s. 6d.

This collection of papers, written by Professor Copland in the twelve months ended April 1951, deals mainly with the related questions of how Australia can achieve expansion and avoid inflation.

The case for expansion is based mainly on the political need for rapid immigration, with its concomitant need for rapid capital formation. In addition, the arrears of the depression years and of the war years need to be made good, and the needs of rearmament have to be met. How are the resources to be found ?

In one passage (p. 52) Professor Copland suggests they might be found by a rise of prices, but elsewhere he presses the case for other methods. In particular he commends higher interest rates (especially on Savings Certificates), higher taxation, higher productivity (which he assumes to be deflationary), the limitation of outlays on the social services, a curtailment of unhealthy or 'luxury' investment (which is at present turning Australia into a 'milk bar economy'), the import of equipment from the U.S.A. from the proceeds of a dollar loan, and (as a last resort) the resumption of price control and rationing.

The significant omission from this list of suggested policies is exchange appreciation, which Professor Copland strongly opposes. His two most convincing reasons are that Australia is at present running an external deficit and that the high incomes of her wool growers and non-ferrous metal producers could best be creamed off by an export tax. He does not see in exchange appreciation a possible way of discouraging investment in industries in which Australia has the least comparative advantage. Indeed, on page 74, he claims, somewhat unexpectedly, that " the blow [of cheaper imports] would fall on the just and unjust alike, on the efficient and the inefficient, and there is little doubt that it would set back the basic plans which Australia has for long term industrial development ". (His own suggestions for discouraging the " expansion of many unessential industries " are the denial of depreciations allowances on investment in these industries, the restoration of materials control, and the control of capital issues.)

A final point (on which I am still not wholly convinced by Professor Copland) concerns the servicing of his proposed dollar loan. Professor Copland believes that the transfer problem could readily be solved by " exporting commodities such as meat, for which a market exists in America that it has not been possible to exploit because of supply difficulties " (p. 37). These supply difficulties might be alleviated by the extra equipment which could be bought with the dollar loan, but has Professor Copland given due weight to the enormous increase in the home demand for foodstuffs which will occur as the result both of immigration and of the natural increase of population? The figures which he himself quotes in another connection (p. 53) are far from reassuring.

Altogether, *Inflation and Expansion* is a worthy addition to Professor Copland's many contributions to economic polemics.

Brian Tew.

Money, Trade and Economic Growth. In honour of John Henry Williams. Macmillan Company, New York. 1951. xi + 343 pp. 37s. 6d.

This volume has been prepared in honour of the eminent Harvard Professor by seventeen writers " who share the good fortune of a personal and professional association with him ". The book is divided into three sections: International Economic Organization and World Trade, Factors influencing the Level of Domestic Economic Activity, and Monetary Theory and Central Banking. These titles, and indeed the wide range of subjects treated under each, fairly reflect the astonishingly wide range of interests covered—I should say illuminated—by Professor Williams in his long career as university teacher, central bank adviser and adviser to O.E.E.C.

All the papers were completed before June, 1950—some evidently rather earlier—and those more closely concerned with describing a state of affairs (Triffin on European payments integration, for example) will be useful as reflecting expert American opinion in that particular conjuncture. It is naturally American opinion that predominates (Professors Robertson and Dupriez are, I believe, the only non-American contributors) and, when European conditions are under discussion, one sometimes misses the authentic flavour of European attitudes. I felt this most in the first part of the book, though I hasten to add that the essays by Kindleberger and Mikesell, on the theoretical problems of international economic unions, show thorough realisation of the difficulties that were overlooked when American authorities so strongly urged Europe, four years ago, to embark on grand schemes of economic union. M. Camille Gutt's demonstration of the need to make devaluation effective by eliminating inflation remains as topical to European problems as it was when it was written.

In the second part (on factors influencing domestic activity) the writers are more concerned with re-stating theory than with pushing its frontiers forward. Professor Fellner contributes, for example, to the economics of growth, going perhaps a rather long way round to reach sensible conclusions. Professor Tobin uses U.S.A. data to show that saving depends more on absolute income than on the income of a family relatively to other incomes in its social group—a surprising conclusion, which cannot be generalised without much wider empirical foundation. Dr. E. S. Mason leaves the problem of wage policy in economic fluctuations in much the confused state it was before, though justice compels me to add that the confusion is not the author's, but belongs to the nature of things of which he writes. The best essay in this second part is perhaps that by Professor Samuelson, making the case against rules of thumb and automatic mechanisms: he once more shows how some of the most acute economists who are masters of mathematical techniques can also excel in demonstrating important truths in clear common-sense English.

In the third part (Monetary Theory and Central Banking) Professor D. H. Robertson contributes another of his "cleaning-up" articles on the theory of interest. Dr. Goldenweiser puts in a neatly written plea that "terms in common use should be employed in their common meanings". Few others could have made this plea with such a clean sheet on their own account; but I think Dr. Goldenweiser has overdone it in complaining of 'propensity', a word that is not in such very common use and does, in economists' usage, fit the need without serious distortion from its recognised meaning. Professor Dupriez makes a commentary on Cassel's association of long-term price trends with gold supplies, and it is not surprising to find that Cassel does not come well out of the argument. Professor Ellis, in "The Rediscovery of Money" comments first on the position of monetary theory (this I found disappointingly negative) and then puts the Douglas Report on the same plane as the Bullion Report of 1810 (I felt uncomfortable about this parallel). Mr. Allan Sproul, a practical central banker in the first rank, brightly states the case for traditional central banking.

Most important of all in this part of the book—and perhaps in the whole book—is Dr. R. V. Rosa's paper on Interest Rates and the Central Bank. This is a solid piece of work, not lending itself to convenient summary. Its main thesis centres round the proposition that the effectiveness of interest rate policy depends partly on the influence exerted on the willingness of lenders to lend. The operation of American institutions is reviewed in the light of this possibility, and considerable reinforcement is built up in support of positive central bank operation upon interest rates. Behind the paper there is evidently a full knowledge and understanding of all the old battles which have been fought over this issue.

In the last few years monetary economics has been going through a period of consolidation, in contrast to the excitements and ferments of the 'thirties. Times are quieter in our subject. This is a very natural reaction, and it is all to the good that the intellectual turmoil of the 'thirties should be followed by a winnowing process. It is this quieter mood that is reflected in this volume, and as such it must be congenial to the economist in whose honour it has been written.

R. S. Sayers.

American Monetary Policy. By E. A. Goldenweiser. McGraw Hill Book Co., Inc., New York. 1951. 391 pp. 38s. 6d.

This research study, undertaken for the Committee for Economic Development, is Dr. Goldenweiser's most important contribution to monetary economics, and in this field it is one of the best books published since the war. Although written almost entirely in terms of American institutions and with American problems in view, there is wisdom here to instruct and stimulate in every country where monetary matters are discussed.

The book opens with a brief discussion of the role of money in the economy, a sketch of American institutions, and of the objectives and methods of the Federal Reserve System. There follow six chapters reviewing the history of the system, beginning with the ideas of its founders and ending with the stable-bond market controversies of 1950 : this historical review is just on the right scale for the English student. The book closes with a discussion of institutional relationships—mainly the vexed question of division of responsibility between the Treasury and the Federal Reserve System—and with proposals for changes in Federal Reserve structure.

Summarised like this, the contents may appear to ramble from one part of the field to another, but in fact the book is a thoroughly integrated unit : for example, the final chapter of reform proposals follows naturally from the historical review in which it repeatedly appears that weakness resulted from hesitations and divisions in an over-elaborate top level of authority.

The book does much more than lead up to a few specific proposals for constitutional change. Its main purpose, whether conscious or unconscious, is to reiterate and thrust home the case against the rule of thumb, and the case for discretion in monetary control. He realises all the temptations : "It is curious how", he says (p. 75), "men of action and theoreticians are likely to get together in the advocacy of laws that would attempt to set forth in detail the nature of responsibilities and powers. For the academic people this is a natural exercise of classroom art, for business men it may arise from the wish to have the law give them support in negotiations with other agencies or with private groups. 'There ought to be a law'." But the temptation must be resisted: "After all," (p. 77) "what the advocates of automatic devices propose is the substitution of their own *a priori* judgment—unencumbered by responsibility and in advance of the event—for the judgment of responsible policy-makers confronted by the event, presumably in possession of all known facts about it, and willing and able to take the appropriate action". In other words, Dr. Goldenweiser puts himself in direct line of descent from Horsley Palmer, one of the greatest of the Bank of England's Governors, and against the tradition of Peel and Overstone (and the 100-percenters of today).

Not, of course, that he believes in no rules at all—he obviously has sympathetic understanding of the development of the Bank of England: "Out of the glorious and time-honored process of muddling through", he says on p. 69, "there emerged a set of rules and practices adapted to the purpose for which central banks are needed". He might with advantage have expanded this passage a little, to show how in the first half of the 19th century the Bank of England temporarily departed from "the glorious process of muddling through" and only picked up again as a result of reverting to it in the subsequent decades.

In reading the book English students will do well to remember that discussion of details is all against the background of the peculiar structure of American commercial banking. The important discussion of reserve ratios, for example, would need a good deal of qualification before being applied to other countries' problems. Occasionally, on the other hand, one would like the American ideas imported into England without any qualification at all. Dr. Goldenweiser explains how in the Federal Reserve System economic intelligence is not only a service for the central bankers who have to diagnose the situation before deciding on policy but "also a service by the system to the public. . . . Understanding of monetary policy by the public . . . helps to establish a climate that makes the policy more effective". So the Macmillan Committee told London twenty years ago—but in the autumn of 1951 it does not appear to have made much difference.

Being designed for a wide American public, the book is reasonably short and so printed as to facilitate reading; and it is exceedingly well written. It merits wide reading also in this country.

R. S. SAYERS.

Monetary Policy for a Competitive Society. By LLOYD W. MINTS. McGraw-Hill Book Company, Inc. 1950. 236 pp. £1 5s. 6d.

In 1945 Professor Mints published *A History of Banking Theory*, in which he pursued the "real-bills doctrine" throughout monetary literature.[1] In the course of that study he introduced three suggestions of his own: that the major portion of short-term debt should be eliminated; that the Government should borrow only on consols; and that fractional reserve banking should be suppressed.

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[1] On that occasion the present reviewer expressed a doubt whether this heresy was as rampant today as Professor Mints suggested. Having just read a report of the recent conference of bankers at Rome, he hereby recants.

In the present volume these three ideas reappear, interwoven with almost Wagnerian complexity into two more—that to announce a policy of monetary stability would itself minimise industrial fluctuations; and that to implement such a policy, budgetary manipulation, with some assistance from open market operations, would suffice. The resulting work is a vigorous but not wholly convincing attack on the stagnationist thesis.

The structure of the book does not make the argument very easy to follow. After an initial statement of the need for stability there is a digression on two non-monetary types of unemployment—frictional, and that caused by high and rigid wages. Chapter 3 locates the main cause of instability in the propensity to hoard, and foreshadows the chosen solution—to flood the community with new money sufficient to maintain the flow of purchasing power. But before this is developed, two chapters on international complications are interposed, of which the general conclusion (p. 113) is that the inherent rigidities of modern economic systems make national currency standards preferable to international ones.

The second half of the book then develops successively what should be the guides for monetary action (plumping for wholesale prices) and how the monetary policy should be implemented. On the way a number of hares are pursued, in particular Professor Mints' dislike of the Federal Reserve System and of the prophets of doom—meaning the stagnationists.

The validity of Professor Mints' thesis depends essentially upon his belief that an assertion by the monetary authorities of their intention to prevent a slump would so reassure business men and the public that any fluctuations which did develop would be self-damping, and would be easily corrected within the limits of budgetary policy. It must be confessed that such a belief is more plausible in these days, when Government budgets devour 30 per cent or 40 per cent of the national income, than it was in the 1930's. Nevertheless, the reader is left wishing that Professor Mints had shewn some awareness of the magnitude of the problem—as it was expounded for instance by Professor Villard in *Deficit Spending and the National Income*—and of the very real danger that what used to be called technological unemployment may recur in a big way when inflation is brought under control.

A slight disadvantage of Professor Mints' vigorous style is that he tends constantly to provoke his readers, by *ex cathedra* statements on side-issues, into wishing to challenge him on these instead of on his main thesis. One example will suffice: he contrives both to use the support given to U.S. bond prices since 1942 as proof of the incomprehension of the Federal Reserve Board (p. 132) and also to cite the independent authority of the Treasury as evidence that the Board could not carry out a suitable policy even if they had one (p. 184).

J. K. HORSEFIELD.

Some Economic Aspects of Increasing Farm Output. By C. H. BLAGBURN. Dept. of Agricultural Economics, University of Reading. Misc. Studies No. 6. November 1951. 36 pp. 5s.

This is an interesting attempt to assess the cost of producing more food. The main conclusion is that, by raising yields and altering choices of products, an increase in output of about 30 per cent. could be achieved over the whole range of farms in the south of England at very low cost, and it is suggested that a reduction of agricultural product prices by 10 per cent. would add to farmers' incentives.

Unfortunately, decreasing costs and backward-sloping supply curves cannot be proven by the system of tabular analysis which Mr. Blagburn adopts. Marginal cost curves as distinct from average actual costs are not estimated for individual farms. Comparisons of aggregates for groups of farms are scarcely valid in the light of wide variations in farmers' abilities, in soil fertilities, and in the quality of livestock. In costing the factors required for expansion no account is taken of additional skills and supervision—or of subsidies on feedingstuffs and fertilisers. Some capital items are seriously underestimated. Again, while tabular analysis may suggest that to aim at high outputs is to reduce costs, the simple truth is that those who are fortunate in a particular year tend to have higher outputs and lower costs per unit than those who are not.

Moreover, in making inter-farm comparisons due regard should be paid to differences between individual farmers in their changing price and cost expectations, uncertainty allowances, and liquidity preferences. Such differences may well have been especially great during the period when the principal decisions were taken that affected the outputs of the three years studied—1946–47 to 1948–49. But even in less disturbed times they are almost certainly highly important. Static analyses based on aggregates of average costs largely ignore them.

JOHN R. RAEBURN.

Economics: An Introductory Analysis. By PAUL A. SAMUELSON. McGraw Hill Publishing Co. Ltd., 1951. xix + 762 pp. 39s.

This volume represents an extensive revision of the first edition 1948. The most notable additions are five chapters on the pricing of the productive factors: these constitute the fourth of the six parts into which the new edition is divided. This extension of the scope of the book has improved its balance. Professor Samuelson still approaches the subject *via* the national income, but in this edition the analysis of the component parts of the economy is in no way sacrificed. Further, there have been some minor rearrangements in the order and content of the chapters, and an attempt has been made to relate the results of empirical studies to the theory of the firm. The first part introduces the basic concept of national income, and places it in the institutional setting of the American economy. The second deals with the determination of the national income, and why and how its level fluctuates. In the third part, Professor Samuelson begins his analysis of the composition of the national income, concentrating on the theory of product pricing. The fifth part deals with International Trade and Finance, and retains the excellent chapter (now Chapter 33) on the Theory of Comparative Advantage. In the sixth part, or epilogue, an attempt is made to compare the price mechanism with alternative solutions of the economic problem.

These additions are both important and welcome. They must, however, take second place to the new spirit which infuses the present volume as compared with its predecessor. The emphasis has been shifted throughout from the problems of the 1930's to those of the 1950's—from mass unemployment to the problems of inflation. In support of this, the illustrative material has been brought completely up to date.

The result is an eminently readable book, imbued with the vitality and enthusiasm of its author. Like its predecessor, it is written primarily for the intelligent layman, both inside and outside the universities, who has no previous knowledge of economics. The result wholly realises its author's aims—a book which forms an excellent basis for a one-year course for a student who does not intend to specialise in economics. Those economic principles only are introduced which are necessary to elucidate important real problems, and there is a consequent economy in analysis. And these principles are applied, as they appear, with effortless skill.

It may seem rather dyspeptic even to indicate the limitations of such a palatable dish. The very success, however, with which Professor Samuelson achieves his stated objectives makes the book a not wholly satisfactory one for the student who intends to specialise in economics. For such a student a more rigorous and elaborate treatment of basic principles is required. Further, it is to be regretted that this is merely a British reissue of the American edition. All the illustrative material relates to the U.S. economy. The book cannot be expected, therefore, to have the same impact on a British student as on his opposite number in America. This defect manifests itself also in the emphasis given to international trade problems ; their treatment comprises rather less than one-tenth of the book.

W. J. L. RYAN.

Economie et Intérêt : Présentation Nouvelle des Problèmes Fondamentaux Relatifs au Rôle Economique du Taux de l'Intérêt et de Leurs Solutions. By M. ALLAIS. Librairie des Publications Officielles, Paris. Two vols. 1947. 800 pp.

Mr. Allais is a French mathematician and a self-made economist. Before he could fully acquaint himself with up-to-date economic science, namely of the Anglo-Saxon variety, he undertook to work out by himself a coherent body of economic theory, along Walrasian and Paretian lines. In 1943, he published in mimeographed form his monumental *A la Recherche d'une Discipline Economique.* Besides numerous articles, he wrote, in 1946, an illuminating booklet, *Abondance ou Misère*, on the state of the French economy.

Economie et Intérêt, a book of eight-hundred pages in two volumes, is rooted in E. v. Boehm-Bawerk, I. Fisher, G. Cassel and J. M. Keynes. It was born out of Mr. Allais' dissatisfaction with the lack of clarity, of rigour and of completeness of the prevailing theories. Chapter IX points to the errors and the partial truths in the former explanations.

Chapters V and VIII contain the basic models of interest-rate determination. In Chapter V the interest-rate is explained in a moneyless economy. The analysis of the supply of savings and the demand for capital is clarifying and rigorous, except for an error on elasticity on pages 116 and 117. In chapter VIII, the liquidity-preference in a monetary economy is taken account of. Mr. Allais thus succeeds in integrating in a coherent whole Boehm-Bawerk's time-preference, I. Fisher's return over cost, and Keynes' liquidity-preference theories. These chapters are the most solid part of the book. They contribute to the clarification and rigorous formulation of the determinants of the interest-rate.

Chapters VI and VII are devoted to the place of interest in the theory of welfare. Allais distinguishes between optimum social *efficiency* and optimum social *productivity*. A state of social efficiency is related to a given capital-equipment, while the theory of social productivity is concerned with a variable capital-equipment, the optimum size of which has to be determined. Whereas for optimum efficiency it is sufficient that the technical rate of interest (or marginal productivity of capital) be the same for every capital-use, maximum social productivity requires that the technical rate be zero. Only in a zero-interest-rate economy would all the technical advantages of " round-about " production be fully utilised.

In chapter IX, the author tries to explain the historical positiveness of the interest-rate. This phenomenon is shown to be due to private land-ownership and to liquidity-preference. Land being indestructible, the capitalised value of its future services tends to infinity as the interest-rate approaches zero. The Casselian upper-limit to the ratio of an individual's assets to his income, coupled with the indefinite expansion of the value of land as the interest-rate decreases, would put a floor to the interest-rate in a moneyless system with private land-ownership (pp. 479-489). In a monetary economy with collective land-ownership, the liquidity-premium of money would prevent the rate of interest from falling below a certain positive level. Allais' analysis is analogous to Keynes' (pp. 495-498). These factors prevent the automatic attainment of maximum social productivity. If this maximum is a goal of policy, as Allais proposes, how can it be made consistent with the consumers' time-and liquidity-preferences ? The author solves the first part of this problem by assuming the arbitrariness of the individual's time-preference. An individual's future welfare depends on his present saving, and thus on his present *representation* of his future satisfaction-function : " what a young individual takes account of, is the satisfaction he derives at time t_0 from the idea of the satisfaction he will obtain at time t_1, and not that satisfaction itself. There is in fact as much difference between the satisfactions S_0 and S_1 of a same individual taken at two different moments in time as between the satisfactions of two distinct individuals considered at a same instant of time" (pp. 163-164). The utility-functions being inter-temporally as well as inter-personally heterogeneous, the psychological interest-rates may be different from the technical rate, whose optimum value is zero.

The time-preference restriction on the maximisation of the " social productivity " being thus removed, Allais proposes several ways to achieve the optimum capital-equipment, one of which would overcome the liquidity-premium of money. He advocates the collectivisation of land-ownership, the fixing of psychological rates that would maximise the supply of savings, compulsory old-age insurance and . . . the gradual depreciation of the circulating medium. This last proposal is a blot that is likely to discredit the book to most readers. Allais proposes to dissociate the unit of account from that of the circulating medium, and to devalue periodically the second with respect to the first. He overlooks the fact that a liquidity-premium may attach to other assets and thus prevent the attainment of his goal.

The optimum capital-equipment being first achieved, the Government would have to allocate consumable income between the young and the old, as it should know better than the young people the psychology of the old. The Government should thus maximise a function of the utility-functions of an individual at different periods of his life (pp. 726-727).

The book contains three mathematical appendices covering one hundred and forty pages.

While the logic of the work is rigorous and clear, the demonstrations are unnecessarily complicated. In spite of the author's repeated apology for brevity, the book is of an excessive length and contains too many repetitions. Allais' economics suffer, moreover, from a lack of maturity and of purity. The policy proposals are based on value judgments and simplistic assumptions which the author expects the reader to swallow as principles of economic science. Several logical slips could have been avoided if the manuscript had been seriously criticised. They occur namely on pages 101, 116, 117, 180, 223, 265, 266, 391, 507, 714. Allais' theory of cycles on pages 417 and 553-554 is very weak and immature.

In spite of its weaknesses, this work reveals a genial, enthusiastic and courageous mind. Mr. Allais with his group of disciples in Paris may start a regeneration of French economic thought. He deserves our admiration and encouragement.

ROGER DEHEM.

Poverty and the Welfare State. By B. SEEBOHM ROWNTREE and G. R. LAVERS. Longmans, Green & Co. 1951. v + 104 pp. 7s. 6d. net.

The pioneer work in social statistics performed by Mr. Seebohm Rowntree may be said to have made its mark in social policy with the long discussion and final acceptance of a subsistence minimum as a primary aim of social policy. With the formidable increase in the scope of the social services both during and after the war, it is obviously of great interest to us to know what the effects of these services have been in regard to the removal of poverty. Mr. Rowntree, together with Mr. Lavers, has once again recorded the progress of social policy manifested in the economic conditions of York.

Again the poverty line has been carefully drawn after minute inquiries into dietary and clothing needs ; and the minimum weekly outgo of a family of five to cover these needs in 1950 was fixed at £5 0s. 2d., excluding rents and rates—approximately double the 1936 figure. Apart from the remarkable decline in poverty between 1936 and 1950 from 30 per cent. to less than 3 per cent. of the working population of York, the most striking feature of the last few years has been the change in the relative importance of different causes of poverty. Old age was the cause of poverty in more than two-thirds of the cases and sickness accounted for most of the remainder. In 1936, unemployment and inadequate wages accounted for over 60 per cent. of the poverty cases ; in 1950 the corresponding percentage was 7 per cent. Nevertheless, although full employment may account for these changes, our investigators maintain that if the welfare measures of 1936 had remained in force, then the proportion of working-class families in poverty would not have been 3 per cent. but nearer 22 per cent.

The direction of the changes brought about by social policy is clear enough, and we must be grateful to the authors for indicating them. However, there are, perhaps, one or two criticisms which affect the accuracy of the tabulated results. First of all, the National Health Service is excluded in the calculation of the real income of families on the grounds that " a great many of its beneficiaries would previously have gone without spectacles and without medical and dental help ". But surely the construction of a poverty line demands consideration of what treatment is a necessary part of minimum standards and not what treatment is actually demanded. Secondly, a person is regarded as below the poverty line if his *income* is below the necessary outlay to maintain minimum standards. We know, for instance, that the average capital of persons drawing non-contributory pensions is about £400 and some of Mr. Rowntree's examples of older persons do not suggest that they are in dire straits if their capital is taken into account. However, this is not to say that the lot of many persons of pensionable age is not extremely hard and, indeed, the concentration of poverty among them found by Rowntree and Lavers is disturbing.

Despite the immense amount of official material produced by the state welfare departments, often badly presented and co-ordinated, there is still an immense field of enquiry open to the independent investigator in regard to social policy. Accordingly, the methods of Messrs. Rowntree and Lavers merit close study.

ALAN T. PEACOCK.

The Exchange Stability Problem. By G. STUVEL. H. E. Stenfert Kroese's Uitgevers-Maatschappij N.V. Leiden. 1950. viii + 242 pp. Fl.11.75.

The question of the circumstances in which the foreign exchange market will be unstable is one around which a considerable literature has developed in the journals. Now, from Holland, comes a whole book devoted to the problem ; both to its theoretical formulation and (more briefly) to its statistical investigation.

Professor Tinbergen has contributed a short preface to Dr. Stuvel's book, and throughout the influence of Tinbergen's approach is clearly apparent. The book owes a debt to Tinbergen both for its general method, and for its formulation of the particular problem under discussion. As an exposition of the econometric method, and as an introduction to the techniques employed, the second chapter is admirable. As a general guide to the inquisitive amateur of such methods, the value of this chapter extends beyond the field of international finance.

A large debt is also owing to Tinbergen for the particular way in which the problem has been formulated. The immediate intellectual parentage is Tinbergen's article in the 1941 *Revue Internationale de Statistique*. Little is owed to the Marshall tradition, of which the best known formulation is that of Joan Robinson. Dr. Stuvel, in fact, considers that the limitations of what we might fairly describe as the Cambridge model are too serious to allow it to be very useful. In particular, the assumptions are " Marshallian " in the sense that indirect effects of the price changes resulting from the change in the exchange rate are disregarded. Attention is only paid in the Cambridge model to direct effects on demand and supply as a result of the exchange rate changes. The simplest 'Cambridge' answer to this criticism is that although subsequent influences on income levels and the like can wipe out some of the effect on the trade balance resulting from the change in exchange rates, they cannot *reverse* the effects because these income changes depend upon the change in the balance. This view is subject to modifications, as for example when relative price changes have effects on the level of saving, and when we introduce an accelerator. It is not with these cases that Stuvel is directly concerned, however.

A complete theory of the exchange stability problem would demand a complete theory of price and income determination for both of two countries. In order to make the theory manageable, it is necessary to simplify. The simplifications used in the Dutch approach are to some extent the same as and to some extent different from those used in Cambridge. In each case the analysis is in terms of comparative statics, and considers small disturbances from an original balance. The Dutch approach, in order to make the problem manageable when indirect effects are considered, takes into account only what is happening in one country and does not attempt to consider the effects of changes in the level of income or of prices in other countries.

The main shortcomings that Stuvel sees in the traditional approach, and which he seeks to correct, are that it is assumed that the home price level and change in the home volume of production do not affect import demand, and that home wage rates do not change. Provision for these shortcomings is partly made by considering a price elasticity of substitution between demand for home and imported goods, instead of the traditional price elasticity of import demand. Moreover, account is taken of several "structural coefficients", covering the reactions of wages to price changes and the marginal propensity to spend and the price elasticity of home demand. These last two are of great importance in Stuvel's system. They are numerically identical when there is no "money illusion", in other words when the reaction on expenditure of a small percentage price rise is the same as that of the same small percentage fall in income. The implications of the use of the term "money illusion" deserve further examination, because "spending" includes investment. It appears quite likely, therefore, that there will be money illusion in Stuvel's broad sense even when consumers and wage earners show no money illusion in the more usual narrow senses. In view of the importance of the existence or otherwise of "money illusion" in Stuvel's system, it is to be regretted that he has not considered at some length the circumstances in which it will be negative or positive, particularly in relation to the making of investment decisions. One suspects that some of his unusual conclusions would seem less surprising in that case; on the other hand one is led to wonder whether a comparative static analysis would still be adequate.

On the basis of his assumptions an extremely lengthy formula is evolved, from which a series of conclusions is derived. These are very clearly set forth ; in fact an admirable feature of the whole book is the distinct statement of assumptions and conclusions. Among the conclusions is a considerable number which are concerned with cases where the equilibrium will be indifferent to exchange rate changes, either because conditions are such that all prices rise in the same proportion as import prices, or because it is assumed that the community continues to consume just as much as it produces. A second set of conclusions is that taking account of the marginal import quota in home production. Broadly, the conclusions in these cases are the same as those of A. J. Brown, if one takes into account the differences in definitions. (Conclusion 16 is of this type, if the verbal statement is made to agree with the mathematics, which it does not in the text.) The third main set of conclusions is that concerned with cases where money illusion exists, or where the marginal propensity to spend has unusual magnitudes. Where the marginal propensity to spend exceeds unity, the position is usually unstable. This is acceptable enough, and the main question remaining is, under what circumstances will this arise ? Probably more important are the conclusions that where either the home elasticity of substitution for foreign goods or the foreign elasticity for home goods is infinite, the stability or instability of the foreign exchange market depends upon the relationship of the marginal propensity to spend and the price elasticity of home demand. If the former is the greater, instability will arise. The significance of all this depends, however, on the economic implications of such " money illusion ".

The practical conclusions which Stuvel draws, on the basis of Chang's published statistics, are that where there is full employment, the balance of payments equilibrium will be nearly indifferent in Germany, France and Italy, firmly stable in the U.S.A. and Canada and unstable for the U.K. and Sweden. Where there is serious unemployment he considers that the balance of payments equilibrium will be almost completely determined by the relationship of the marginal propensity to consume and the price elasticity of home demand.

Dr. Stuvel has given us an extremely clearly presented analysis of this problem, and it will prove valuable to all students of the subject. It is cause for regret that he should have laid so much emphasis on conclusions which really do not add much to the Brown-Robinson position, and that instead he did not investigate and explain further the significance of " money illusion ". Nevertheless, Dr. Stuvel has made a valuable contribution to the literature, and deserves the thanks of all oligoglot economists for making it available in a widely read language.

A. C. L. Day

United Nations: World Economic Report, 1949-50. U.S.A. June, 1951. 17s. 6d. 234 pp.
Bank for International Settlements: 21st Annual Report, 1950-51. Basle. June, 1951. 254 pp.

After a two-year gap, the United Nations have resumed publication of a *World Economic Report*, covering the year 1949 and the first half of 1950, with " Some preliminary comments on tendencies since mid-1950 ". As the Bank for International Settlements (following its usual practice of combining a survey of world monetary affairs with its annual report) has issued its 21st report at practically the same time, it is convenient to review together these impressive publications. The B.I.S. Report is almost nine months more up-to-date than that of the United Nations—a great point in its favour. The United Nations' Report has a broader scope, not only because it covers a longer period, but because it deals more fully with general economic developments, in particular with the domestic economic development of a larger range of countries, including Eastern European, Latin American and Far Eastern countries to which merely incidental references are made by the B.I.S. Report. In addition the United Nations' Report includes a statistical appendix, a chronology of major economic events during the relevant period, and a detailed index. This means that the B.I.S. Report, with its more limited scope, can undertake a more intensive analysis of the data and problems under examination.

Both reports contain an immense array of facts and figures, clearly and carefully presented and interpreted, that renders them indispensable reference-books for the student of world economic affairs. The range of topics and of geographical areas included in these volumes is so great that no more can be attempted here than to indicate their respective coverages, angles of approach, and special features, and to comment briefly upon some of their outstanding conclusions.

The United Nations' Report deals, in Part I, with the major changes in the domestic economic conditions of a number of nations, which it classifies as follows: (i) Economically developed private enterprise economies (i.e. U.S.A.; Continental Western European countries; U.K.; Canada and Australia); (ii) The centrally planned economies of Eastern Europe; (iii) Selected Latin American and Far Eastern countries; (iv) Germany (East and West); (v) Japan; and (vi) China and neighbouring areas. Supplements are to be issued on Africa and the Middle East, whilst more detailed surveys will be published later by the regional commissions for Asia and the Far East.

In Part II a survey is made of developments in the international trade, trade policies and relationships of the principal areas, including an account of the progress and achievements of the European Recovery Programme and of the Organisation for European Economic Co-operation. Part III analyses, in considerable detail, post-war developments in the dollar position of the main trading areas, and the causes and effects of the devaluation of 1949.

The conclusions drawn with regard to the effects of devaluation and the prospects facing the economically under-developed countries are of particular interest. It is pointed out that devaluation was only one of a number of significant economic developments affecting the dollar trade balance, that the non-devaluing countries did not lose ground in relation to devaluing countries in American markets, and that the amount of substitution in their markets of Western European goods in place of goods from the United States was relatively small. From these and other relevant data it is concluded that it has proved almost impossible to disentangle the influence of devaluation on the dollar trade balance from that of other factors, whilst there is reason to suppose that certain long-term factors tending towards a shortage of dollars are likely to re-emerge and to persist. Similar lines of analysis show that, whilst during 1950 under-developed countries improved (by various means) their trade balances and terms of trade with dollar countries, this was largely attributable to drastic curtailment of imports, sometimes at the expense of economic activity, so that—even apart from the effects of the recent rearmament drive on the availability of many types of goods—it may long prove difficult for them to secure, from their own resources, those imports of consumer and capital goods necessary to improve (or even to maintain) the standard of life and to increase production for economic development. The report concludes that " appropriate and timely measures are needed if the aspirations of many under-developed countries are not to be discouraged and if their imports of capital goods are to expand at least as rapidly as their ability to pay for them with expanded exports " (p. 9), and that " The economic development of the under-developed countries remains the most important single long-run economic problem confronting the world " (p. 10).

The B.I.S. Report is primarily concerned with the monetary and financial aspects of economic development in the more advanced economies, and in international monetary, price and trade relationships and policies in general. This special emphasis arises naturally out of the functions and activities of the Bank, which (together with a review of the origin and development since its establishment in 1930) were admirably explained in the 20th Annual Report (for the year 1949–50).

The Report under review points out that the Korean conflict introduced a new phase in world economic affairs, which has altered, and in some cases even reversed, a number of previous trends. This has provided a suitable occasion for a historical retrospect, before proceeding, first to estimate the progress made towards recovery, between 1945 and 1950, and then to visualise the nature and outstanding problems of the new phase. The comparison made of the economic effects of the two world wars, and the reviews given of the progress and effects of Marshall Aid, of the income-stabilisation policies adopted by many countries (to prevent or check inflation) and of the development of the Intra-European Payment Schemes (culminating in the European Payments Union) are most interesting and penetrating. There is, for instance, a most stimulating discussion of the unfortunate effects of the carry-over from the inter-war period of ideas—including both Keynesian theories (as presented in the thirties) and the principles embodied in the New Deal and in Germany's full-employment policy —" which are certainly not applicable to the task of post-war reconstruction " (p. 11). Specific reference is here made to the belief in a cheap money policy, and the constant fear of depression, which have tended to prevent the adoption of appropriate attitudes and policies, and hence have rendered post-war reconstruction more difficult. It is concluded that inflation has been, and still is, the real danger, which should be tackled by a judicious combination of policies, including higher interest rates. It may, perhaps, be suggested that the possibility of depression has been too definitively dismissed. Surely the argument for preventing run-away inflation would only be strengthened by pointing out that if this is not done the possibility of depression and unemployment is only too real ?

VERA ANSTEY.

Christianity and Human Relations in Industry. By SIR GEORGE SCHUSTER. The Epworth Press. 1951. 128 pp. 6s. 6d.

A Swedish Case Study on Personnel Relations. By S. CARLSON and P. ERNMARK. The Business Research Institute, Stockholm. 1951. 67 pp.

How far productivity depends on good relations in industry is a question urgently posed with a high level of employment. Whether a person ought to be treated as a means to an end is an ethical question, raised in its modern form by the conveyor belt. Sir George Schuster puts first the ethical question, on theological grounds. He gives a timely warning that to confuse good industrial relations with sentimentality is to bark up the wrong tree. Charity does not supersede justice. Conversely, better relations will not be achieved if they are sought merely to raise output ; this is the psychological law upon which much profit-sharing foundered under earlier conditions.

To fit the round peg into the round hole is a dictate not only of ethics but of efficiency too, to ignore human relations and attitudes is both wrong and wasteful—this is Sir George's thesis. He marshals as evidence some of the existing material on industrial relations, *inter alia* the dissatisfaction and failure as incentives of inappropriate piece-work schemes, the incidence of neurosis among factory workers as shown by the remarkable report of the Industrial Health Research Board, and latterly the Glacier Metal venture. Recent evidence on the cost of labour turnover can be added to the list.

The reports of the Anglo-American Committee on productivity, in particular their comments on attitudes to work, are still tingling in our ears. It is fashionable nowadays to tilt pro or contra the nationalised industries, but, as Sir George points out, the problem lies deeper and is implicit in the various forms of modern industrial organisation. He stresses the importance of empirical investigation as giving a scientific basis for solving problems of relations in industry. It may seem ungrateful, if not lazy, to carp, for Sir George has fostered much recent research. One would, however, welcome more formulation of the questions which are sorely in need of an answer, on properly documented grounds and in terms appropriate to the economic and social structure as they have grown in this country. Such questions might include what precisely are the costs and contribution to efficiency of welfare schemes, what are the reasons for resistance to changed methods of technique and payment of wages—after all, the weavers are a glorious exception—and what are the conditions of co-operation in production.

This survey of two Swedish firms in the textile and engineering industries was carried out at the suggestion of U.N.E.S.C.O. As case studies they are a *hors d'oeuvre* and for general conclusions more enquiries are needed. Of particular interest is the difference in reactions in the two firms to time-and-motion study, from which the authors deduce the need for further investigation of the effect of changing techniques on industrial relations. While the freer method of investigation has its value, it is not quite clear that the survey makes up in good sense what it lacks in sampling method.

ANN TATLOW.

Conservation of Natural Resources. Edited by GUY HAROLD SMITH. John Wiley & Sons, Inc., New York. Chapman & Hall Ltd. 1950. xii + 552 pp. $6.00.

This large and extensively illustrated volume is a revision, with numerous additions, of Professors Parkins' and Whitaker's 1936 collection of essays designed to provide " an enthusiasm and an understanding of the essential nature of resources and the measures necessary to save from wasteful destruction our national heritage ". Twenty specialist authors, chiefly geographers, describe the problems of soil erosion, forest destruction, waterpower loss, wildlife and mineral depletion, etc., discuss the possibilities and techniques of conserving these resources, and review what steps have already been taken by the federal, state and local governments towards conservation.

From the economist's point of view, the collection has three serious defects. The virtual exclusion of consideration of imports and exports makes the discussion of self-sufficiency in each resource realistic only in case of extreme American isolation, or in a period of prolonged defence preparation. The failure to discuss possible manufactured substitutes and substitution relationships among the natural resources themselves leaves a logical gap in the argument for government action. Finally, the uneven treatment resulting from letting each expert handle his subject in his own way leaves the reader without a clear picture of what the United States is threatened with, or what steps the authors feel it should take. Instead of a summary, the editor provides an essay on regional and national planning; nowhere is there a statement of the *overall* " enthusiasm and understanding " which should govern our attitude to natural resources.

In addition to Jevons' *The Coal Question*, which is confined to one resource, there have been several noteworthy predecessors of this work. Two early American books, by Van Hise, and by Ely *et al.* did not hesitate to tackle the economist's problems of time preference, social *versus* private benefits and costs, and the economies and diseconomies of large-scale public action. These problems also interest geographers and engineers, as is shown by the recently published proceedings of the United Nations Scientific Conference on the Conservation and Utilisation of Resources. It is hard to see how the student will learn much about the costs and alternatives to conservation from the present book.

A. D. SCOTT.

Statistical Digest of the War (History of the Second World War, U.K. Civil Series). H.M.S.O. and Longmans Green. 1951. xii + 248 pp. 32s. 6d.

The Government has a greater need of statistics—and more reasons for not publishing them—during war than at other times. Many of the statistical series we now find so useful were first developed during the second World War, when little was, or could be, issued to the public. The statistical black-out was partially lifted before the end of the war, e.g., in the increasingly informative National Income White Papers and in *Statistics Relating to the War Effort* (Cmd. 6564, November, 1944). But nothing like a complete story, in statistical terms, was told before the appearance of the volume under review. The Civil History of the war depends heavily on statistical information, much of it detailed and specialised, and scattered throughout the various volumes. It can only be followed, however, against a general background of statistical data, put together consistently and in one place. This need for a statistical reference book is met by the present volume, compiled by the Central Statistical Office for the Civil History series. It is a splendid publication, carefully compiled and beautifully produced. The general lay-out, including the wide page, is similar to that of the regular publications for which the Central Statistical Office is responsible. The definitions and technical notes are detailed and adequate for all uses, except perhaps the most specialised. Altogether it provides further evidence that the standard of publication of British official statistics is not surpassed by any other country.

Some topics are more adequately covered than others. The development of the war placed emphasis on the need for particular data so that, with limited statistical resources, information in other fields was less fully collected. In addition, however, we cannot escape the conclusion that a few series (e.g., on food stocks) which were obtained and used during the war are still being withheld from publication. Particularly good information appears on the details of munitions production, on shipping, on food supplies (apart from stocks), on raw materials and on manpower, usually in monthly or quarterly series and generally from 1939 or 1940. The data presented on the life of the community during war are much more skimpy. Indeed, even a casual glance shows that many aspects of civilian life are virtually ignored, e.g., the incidence of taxation, the availability and prices of consumer goods, and social conditions generally. Even the casualties suffered by civilians (apart from entries in the analysis of deaths), and the damage to their houses and property caused by enemy action and war conditions, are passed over.

Other and more technical objections can be made. Munitions production is well documented in detail; what is lacking is an over-all index of output of munitions (or any means of combining the series published) and an indication of how the total resources of the country were developed and apportioned. Only partial figures are given on such important topics as losses of materials and equipment at sea, and the arrivals of lend-lease supplies. It is unfortunate, also, that the national income data for the war period, as given here in rather summary form, should differ in content and presentation from those currently given in the National Income White Paper. Considerable changes were made between the 1950 and the 1951 issues of the White Paper; the present volume was completed after the publication of the 1950 White Paper, and the national income figures, following the scheme adopted in that issue, are not comparable with those of the later White Paper.

Criticisms of a compilation of this kind are always easy to make and no reviewer can resist the temptation to make them. In the present case, however, the general conclusion is clear. This is a massive and invaluable collection of statistics of the war period. In quality it is fully up to the standards set both by the Central Statistical Office in its regular publications and by the other volumes which have already appeared in the Civil History series.

R. G. D. Allen.

Chance and Choice by Cardpack and Chessboard. An Introduction to Probability in Practice by Visual Aids. Volume I. By Lancelot Hogben. Max Parrish & Co. 1950. 417 pp. 50s.

This is the first volume of a treatise which sets out to cover the main fields of statistical theory and method. Small-sample theory and most of the analysis of variance and co-variance will be treated in the forthcoming second volume; the present instalment covers moments, correlation and the ordinary tests for large samples.

In the recent past a large number of textbooks on statistics have been published in this country and the United States, and an addition to their number should therefore justify itself either by appealing to a new group of students or by different methods of presentation. The present book would qualify on the second of these points only. The audience to whom it is addressed consists of those students who, whilst not being expert mathematicians, have reached a standard in that subject in which they are acquainted with the calculus and the properties of the simpler series. The mathematical level is therefore slightly higher than that demanded by Yule and Kendall's well known *Introduction*, but is approximately the same as that of Professor Weatherburn's textbook.

It is, however, in presentation that Professor Hogben differs most from the orthodox textbooks. He has for long been an advocate of visual aids in education, and in this textbook his ideas are applied to the teaching of statistics. The book is illustrated by 84 handsomely designed and beautifully printed colour charts which have, however, one drawback which is probably due to unavoidable technical reasons: some of the figures are printed in such small type that it is difficult to read them without the aid of a magnifying glass. The colour charts illustrate the properties of a number of simple probability models. Professor Hogben spends considerably more time on a discussion of these models than do other textbook writers. This is due to his anxiety to bring out clearly the logical assumptions which underlie the statistical tests in common use. In his view it is best to discuss the simplest models first and then to generalise from them to the more complex. His discussion of these logical bases is important and will be of benefit to all students of the subject. But the method has disadvantages. The mathematical argument is often unnecessarily prolix and involved. Moreover, the charts are not perhaps as universally helpful as Professor Hogben believes. There must be many people (the present reviewer is one of them) to whom a study of the charts adds singularly little illumination. I cannot help feeling that some of the more elegant and general proofs which can be achieved by using a little more mathematics are intellectually more satisfying than the process of arguing from simple models which Professor Hogben uses, and I do not think that the limitations of the procedures need necessarily be forgotten when slightly more sophisticated methods are used.

The defects of the treatment come out most clearly in the chapter on correlation, which a student who is new to the subject would find difficult to follow. In this connexion it is surprising to note the rather subordinate treatment that regression receives in this volume. Moreover, Professor Hogben occasionally departs from the accepted terminology, which is admittedly illogical on occasions, but it makes further study more difficult when one has to find equivalents for the terms used in other textbooks.

These remarks are necessarily subjective in character. Different methods of presentation will appeal to different students. There are many parts of this book which I found stimulating and interesting. But had I been confronted with this text as a first introduction to the subject I doubt whether I personally should have profited much from it. But other students—with a more acute sense of visualisation than I possess—might find that a thorough and careful study of the book might repay their efforts.

E. Grebenik.

Capital Imports and the American Balance of Payments 1934–39. By Arthur I. Bloomfield. Chicago University Press. Cambridge University Press. 1950. xvii + 340 pp. 45s.

One of the most striking features of the balance of payments of the United States in the inter-war period was the movement of capital, both short- and long-term, which for magnitude of sums involved and abruptness of changes in direction has never been equalled. Such a phenomenon invites investigation and in this Dr. Bloomfield's position is pre-eminent. His earlier paper on the American balance of payments in the 'twenties, published in the *Quarterly Journal of Economics* of May, 1943, is one of the few outstanding contributions of recent times in applied international economics. In the present study the author maintains that clarity of exposition, enviable knowledge of the literature and acuteness of statistical analysis which are shown in his paper. Yet the present work lacks the intellectual stimulation of an inductive verification of an adjustment mechanism given by his previous study. This is, of course, no fault of the author's; the nature of the problem is essentially different. In his paper he was concerned to explain the parallel fluctuations in the long-term capital balance and the trade balance. After showing the existence and closeness of this parallelism and noting the shortcomings of previous attempts at explanation, Dr. Bloomfield, it will be remembered, advanced a neat and highly plausible hypothesis to account for the cyclical movements in direction, though not in amplitude, of the long-term capital balance.

The phase covered by the present study does not permit of similar treatment. " Rather," as the author says (p. 290), " does the episode provide an egregious example of the failure of the mechanism-of-adjustment process, because of a number of special factors, to operate at all." The study is concerned to analyse the causes, characteristics and effects of the massive movement of capital to the United States in the six years beginning with the devaluation of the dollar in January, 1934, and ending with the outbreak of war in September, 1939. In successive chapters the author examines, with a wealth of well presented statistics and references to the literature, the causes of the movement, the form it took, the relationship between capital imports and gold imports, the operations of the exchange stabilisation fund, the problem of control, sterilisation of gold imports and, finally, explains the absence of adjustment of the American balance of payments. For this last he holds three factors mainly responsible :—(*i*) the capital imports were almost wholly non-income-generating, going into idle balances and the financial circulation ; (ii) interest rates were so low already that the further depression made little difference to the level of private investment outlays ; and (iii) the loss of capital and gold did not seriously restrict the level of dollar imports of the countries concerned.

It can be said with confidence that Dr. Bloomfield has produced the definitive study of his subject. Quite apart from the merits of the book as a case study, the autopsy raises several general issues, such as the concept of equilibrium rates of exchange and the control of capital movements, about which the author has something of interest and importance to contribute.

D. J. MORGAN.

La Banque Nationale de Belgique. Vol. I, 1850–1918. By P. KAUCH. Société Belge D'Imprimerie, Brussels. 1950. 432 pp.

This volume was prepared at the invitation of the Bank to celebrate the occasion of its centenary, and students both of comparative banking and of banking history will welcome this scholarly addition to the literature by Professor Kauch. The banking structure inherited by the new Belgium of 1815 consisted (*a*) of a group of private financial houses, and (*b*) of several large banks. In the course of the next few years, a number of other banks were founded. Several were important provincial establishments and two were on a national scale—the Société Générale (founded 1822) and the Banque de Belgique (1835). Of the two latter it may be said that their history is almost the history of the period to 1850. Indeed, the Banque de Belgique was founded substantially to offset the power of the Société Générale, but little benefit to the economy could result from a situation which developed into a feverish competition for business. Yet it was only when a second financial crisis hit the country in 1848 that the urgency of monetary reform became apparent. Much of the credit for the eventual founding of a national institution must go to Frère-Orban, who became Liberal Minister of Finance in 1847. Protracted negotiations followed. However, once agreement had been reached, the passage through Parliament of the necessary legislation was quick. The long-drawn-out doctrinal debates, which commonly precede the establishment of a central bank, had already expended their main force. Frère-Orban had brought his ship to harbour at last.

Of course, the new central bank had its teething troubles and at first was subjected to the usual political attacks. It weathered its first financial crisis in 1857 and gradually developed a tradition of experience. For both historical and economic reasons, however, Belgium could scarcely enjoy complete financial autonomy and currency relations with France necessarily had to be close. It was considerations of this kind which lay behind the creation of the Latin Union in 1866, whereby Belgium joined with France, Italy, and Switzerland in an agreement to maintain interchangeable currencies. This was the era of bimetallism and the author's summary of the debates stalks across the pages like the ghost of another century. Gradually, however, Belgium was steered towards acceptance of a gold standard currency and the Latin Union—after one or two half-hearted struggles to survive—was finally wound up. The other highlights of the pre-1914 period relate to the two renewals of the Bank's charter—in 1872 and 1900. On the first occasion, matters went fairly smoothly, despite the panic of 1870, when the Government feared invasion. In 1872, Malou was there to ease the charter through the parliamentary shoals. He was an old political opponent of Frère-Orban, but sympathetic to the Bank. Indeed, but for the vagaries of politics, he might well have fathered the Bank himself. At the end of the century, however, the political atmosphere was rather different. The Socialists pressed for a form of nationalisation but the new statute of 1900, when it finally emerged from the debates, maintained substantially unchanged the previous arrangement for co-operation between Bank and Government. On both occasions, the renewal was for 30 years. Throughout this pre-war period, the National Bank remained primarily a bank of issue. Its central banking functions were not yet fully developed and its rôle in these matters was somewhat passive. The period covered by the present volume ends with World War I. There was the usual financial crisis in 1914, followed by invasion and occupation. Initially, the Bank followed a policy of non-co-operation, but the only result of this was the transfer of the note issue from the National Bank to a new department of the Société Générale. With the end of the war, the stage was set for reconstruction and further development. This will be the subject of the second volume.

J. S. G. Wilson.

Introduction to Statistical Analysis. By W. J. Dixon and F. J. Massey. McGraw-Hill Book Company, Inc., New York. 1951. x + 370 pp.

There are now such a vast number of statistics textbooks, ranging from elementary books needing no mathematics beyond addition and subtraction to severely mathematical texts, that it is difficult to understand why further ones are continually being produced. During the last few months of 1951 at least six new general textbooks have appeared in our bookshops ; others are promised on the advertisement pages of the journals. To the teacher, as to the reviewer, the resulting profusion of books presents problems. The teacher, in recommending a book to his students, can at the very best state a personal preference for one of several texts, between which there is probably very little to choose. As regards the reviewer, he must be forgiven for approaching any newcomer to the field with some prejudice and for judging it on the very strictest standards.

In view of this, it is a pleasure to record the opinion that the particular book under review belongs in the top rank of statistics textbooks. It may be regarded as a companion volume, perhaps an introduction, to another recent American book (A. M. Mood, *Introduction to the Theory of Statistics*) which, on a more advanced level, is equally excellent. Both books are concisely and clearly written and can be recommended for their general approach and presentation. Furthermore, they avoid the over-complicated and inelegant notation of many of their American predecessors.

As its title indicates, the book is concerned with statistical analysis rather than with the theory of statistics and no mathematics beyond algebraic addition, subtraction and multiplication is demanded of the reader. The explicit aim of the authors is to approach the understanding of statistics through sampling experiments and this approach pervades the book from the early chapters. In fact, the student is introduced to the concepts of populations, samples and sampling distributions in chapter 4 and has read about statistical inference, the testing of hypothesis and the analysis of variance by the time he is half-way through the book. One would not want to say categorically that this type of presentation is preferable to the more usual one of elementary books, in which sampling and allied subjects are left to a fairly late stage, but it may well be that it gives a more logical and unified picture of statistics to the average student.

Three other features deserve mention. First, a chapter on non-parametric statistics is included in which some of the more elementary tests are presented. Secondly, there is a chapter on sequential analysis which will serve as a useful, and readable, introduction to this modern development. Thirdly, the book contains an unusually wide selection of tables (over 70 pages are devoted to these).

Finally, one small point of criticism. In planning future editions, the authors might reconsider the chapters entitled " Macrostatistics " and " Microstatistics ". As they stand, they do not fit well into the general line of development and the various points in the analysis of small and large samples seem to belong more appropriately to other parts of the book. Furthermore, the notes on statistical sorting and tabulating machines could well be omitted, while the unattractive " animated cartoons " illustrating the functions of these machines are certainly out of place in a book of this kind.

C. A. Moser.

Psychological Analysis of Economic Behavior. By GEORGE KATONA. McGraw-Hill Book Company, Inc. 1951. ix + 347 pp. 42s. 6d.

The author of this book is Professor of Economics and Psychology at the University of Michigan. In the past ten years he has worked on various survey investigations, particularly the Survey of Consumer Finances of which he is Programme Director. Earlier he was engaged in psychological research, being an adherent of the gestalt school of psychology. Since there appear to be considerable divergences of opinion and method in psychology, the economist may ask whether a different psychologist would have written a very different book. Perhaps a guess may be ventured that most of the differences would be found in the two chapters in the first part of the book where Professor Katona provides a brief but (to the layman) interesting introduction to such matters as field theory, the relation of the individual to the group, the general principles of learning and expectations. Later in the book psychological terms are used relatively infrequently and the discussion presents no difficulty. Thus one does not have to be an expert to understand the distinction between habitual behaviour on the one hand and genuine decision making (rational behaviour) on the other, or to agree that businessmen have no one single motivation and that it is worth while attempting to find out the relative importance of different factors. Survey techniques apart, Professor Katona brings to economics a method of approach rather than a bag of tools, and the whole of his book is admirably " common-sensical ".

Apart from the introductory chapters and an interesting final chapter on survey methods, the bulk of the book is devoted successively to " Consumer Behavior," " Business Behavior " and " Economic Fluctuations." The first of these sections, which makes use of factual material obtained from the Survey of Consumer Finances, is much the best. There is too much material for any brief summary to be useful; anyone interested in the consumption function should read these four chapters for himself and see how useful the approach of a social psychologist can be. One rather surprising finding may be mentioned however; it appears that (in post-war U.S.A.) dissaving has been at least as frequent among those who experienced large income increases as among those whose income rose little or not at all.

The sections on " Business Behavior " and " Economic Fluctuations " are less interesting, particularly the latter which could with advantage have been left out, for the potted versions of economic theory are unsatisfactory and the vague discussion of interrelations between economic and psychological factors contains little that is new. There is a delusion all too common among economists that they can write books which are both comprehensible to the layman and continuously interesting to their fellow economists. The result, as with this work, is too long a book, and in Professor Katona's case a rather diffuse style and loose arrangement aggravates matters. As has already been said, however, there is much of real value in his contribution, and he has made a most convincing case for the use of psychology in economic research.

RALPH TURVEY.

SHORTER NOTICES

Balance of Payments Yearbook. Vol. III, 1949–50. International Monetary Fund. Washington. 1951. v + 436 pp.

The present volume represents a substantial advance over its predecessors in the amount of up-to-date information and regional classification that it contains. As in the previous volumes, the data are given both in a standard form, which is much the same for all countries and uses a gross basis, and in a financing form which is on a net basis. While the latter could be brought up to 1950 it was feasible to present the accounts in the standard form only up to 1949. Even so preliminary statements for the full year 1950 are presented for some 40 countries and balances of payments classified by regions are shown for 30 countries.

Full Employment Objectives in Relation to the Problems of European Co-operation. The Secretariat of the Council of Europe, Strasbourg. 1951. 68 pp.

This report provides a comprehensive 'application' to Europe of the main recommendations of the United Nations committee of experts on measures for full employment. If the intention was to supply a document for debate and discussion it succeeds admirably. But before it could be used for more than this many are likely to dispute much of its basic analysis (taken over from the United Nations report) and require a more thorough statement of some of its more important suggestions.

The Liquor Tax in the United States, 1791-1947. By TUN YUAN HU. Monographs in Public Finance and National Income, No. 1. Graduate School of Business, Columbia University. New York. 1950. viii + 188 pp.

As Professor Haig remarks in his foreword to Dr. Hu's doctoral dissertation, " why the federal liquor tax should have waited so long to find its historian is one of the minor mysteries of American public finance ". The tax when imposed has always been an important source of revenue. The story from its inception in 1791, which brought about the Whiskey Insurrection, to the Volstead Act and afterwards is one of great struggle between various vested interests ranging from the distillers to the Duponts. The reform of the liquor taxes after the Prohibition era presented a fascinating problem in applied economics.

Dr. Hu provides us with a well documented history interspersed with intelligent comment on the economic issues and some absorbing details of the more exciting episodes of the early opposition to the taxes. The economist will probably be most interested in the discussion of the economic effects of prohibition.

The French Franc between the Wars, 1919–39. By MARTIN WOLFE. Columbia University Press, New York. Oxford University Press. 1951. 229 pp. $3.25. 21s.

Through the inter-war period major events so jostled each other across the French monetary scene that a book of this length cannot give more than a sketch. It is in the Columbia Faculty of Political Science Series, and is a competent and sensible compilation, written with a lively sense of the successive illusions from which the French public suffered. As the 'twenties have been frequently studied before (Dulles, Rogers, etc.), the author has wisely given more than proportionate space to the post-1929 years, though even for these there is space for little detailed analysis. There is an excellent bibliographical note.

A Breviate of Parliamentary Papers, 1917–1939. By P. and G. FORD. Basil Blackwell, Oxford. 1951. xlviii + 571 pp. £2 12s. 6d.

This guide to reports of Royal Commissions and other official committees of inquiry covers all the Parliamentary papers (other than Hansard) on constitutional, economic and financial policy, and legal administration. For each report there is a note of the membership, terms of reference, its main argument, conclusions and recommendations. Libraries are often ill provided with these papers and bombing and other circumstances have made many unobtainable. In summarising the arguments the compilers must often have been tempted to comment, but a sample check confirms that complete objectivity has been maintained. Professor and Mrs. Ford are to be congratulated on their excellent and extremely valuable work—and may we ask them for a companion guide to economic debates and statements in Hansard ?

The Trowbridge Woollen Industry as Illustrated by the Stock Books of John and Thomas Clark, 1804–1824. Edited by R. P. BECKINSALE for Wiltshire Archæological and Natural History Society. Devizes. 1951. xxxvi + 249 pp. Limited edition.

In a scholarly introduction to this source material, based on wider research in the West of England textile industries, Dr. Beckinsale has embodied a most useful and detailed description of the process of woollen manufacture. He also corrects the conventional picture of an industry crushed out of existence by its more successful West Riding competitor. Though village workshops frequently succumbed, progressive manufacturers in West Country towns, ready to move with the times and take advantage of steam power, increased both their profits and the volume of their operations on a scale hardly affected by the short-term fluctuations of the early 19th century.

Axel Nielsen : In Memoriam. (In Danish.) Published by the Danish Economic Association as a supplement to *Nationaløkonomisk Tidsskrift*, Vol. 89. 260 pp.

This volume of essays starts with a paper by the Professor of Economics at Reykjavik on the usability of the maximisation principle in economic science and concludes with a paper by Professor Zeuthen on unemployment and inflation. The other twelve papers contributed by economists from Norway, Finland, Sweden and Denmark deal with a variety of topics in which the late Professor Nielsen was interested, including interest theory, the capital market, economic history and international trade.

Problems of Unemployment and Inflation 1950–51. U.N. Publication No. 1951, II, A.1. H.M.S.O. 1951. v + 173 pp. 9s.

This publication is based on replies of twenty-one governments to a questionnaire concerned with full employment standards and domestic economic trends and policies. The countries analysed have been divided into three groups : the economically developed predominately free enterprise economies, the planned economies of Eastern Europe, and the underdeveloped economies. Of the twelve developed free enterprise countries which replied only Britain stated that it had adopted a specific full employment standard (of 3 per cent. at the seasonal peak). Several countries considered it unnecessary to fix a standard because of their currently low levels of unemployment. Developments during 1950–51 are summarised, and a selection of the replies as actually submitted by some of the governments concludes the book.

National Income and Product of the U.S. 1929–1950. Supplement to the Survey of Current Business 1951. Washington. vi + 216 pp. $1.

This supplement, which replaces the much smaller 1947 one, should be most useful to economists and statisticians. In addition to sixty large pages of statistical tables, and a discussion of the concepts underlying them, there are estimates of certain series in terms of 1939 purchasing power and a brief review of some important economic trends since 1929.

A new and important innovation is a fairly extensive discussion of the statistical methods and adjustments used in order to obtain the required series. This is most helpful in giving some indication of the reliability of individual series and in facilitating the often arduous task of comparing the statistics used in other studies with those published by the Department of Commerce. The need for guidance is emphasised by the statement that "without significant exception the reported information is not in a form in which it can be entered directly into the National Income and Product Accounts".

The Processing of Colonial Raw Materials: a Study in Location. By CHARLOTTE LEUBUSCHER. H.M.S.O. 1951. 186 pp. 10s.

This study will interest two groups of readers. It should do much to dispel the misconception that is prevalent in many colonies that the processing of local raw materials is always the best first step in a programme of industrial development. Moreover, Dr. Leubuscher presents five case studies in the location of industry, and her work will thus interest those concerned with that problem.

Markets are held to be the principal factor that influences the location of industry. This may well be so. But a defect of the study is that it is not always clearly shown why other factors are comparatively unimportant. Further, Dr. Leubuscher is not always as clear as she ought to be on *proximity* to markets and *access* to markets.

Unternehmergewinn und Arbeitslohn. By ERICH CARELL. Richard Pflaum Verlag, Munich. 1950. 174 pp.

This volume is an excellent introduction to the theory of the firm. Professor Carell analyses the emergence of profit under conditions of technological progress. Although termed "dynamics" it is really a study in comparative statics. An austere discussion of the effects of credit creation, price maintenance and monopoly leads Carell to the conclusion that only neutrality of money (defined as stability of circulation, i.e. constant MV) and pure competition can lead to full employment and a just distribution of the national product. He is thus a disciple of the "soziale Marktwirtschaft" school, denies the inevitability of industrial combination and scorns governmental control over production and credit. Since Carell accuses Marshall of terming quasi-rent what is really interest, we may be allowed to point out that what Carell calls profit is actually quasi-rent.

Der Aussenhandel zwischen marktwirtschaftlich organisierten und zentralgeleiteten Volkswirtschaften. By W. GRAF. Polygraphischer Verlag, St. Gallen. 1951. xvi + 190 pp. S.Fr. 12.

This book represents an attempt to analyse theoretically and to contrast the organisation of foreign trade in the competitive economy and in the centrally planned economy. Dr. Graf says little that is new, and by restricting the major part of his arguments to the case of pure competition on the one side, and pure planning—on the Soviet model—on the other, his analysis becomes highly unrealistic. The most interesting part of the book is his description and evaluation of various trading agreements between Switzerland and the Soviet countries. Far greater space could, with advantage, have been given to this section. Dr. Graf might also have supported in more detail his contention that free economies could arrive at reasonable trading relations with the Soviet area without recourse to state trading.

Bilanzbildsequenzen. By ERWIN FEIN. A. Francke A. G. Verlag, Berne. 1951. 168 pp. S.Fr. 18·50.

This book is concerned with the application of the methods of accountancy to research in macro-economic theory. Dynamic problems are studied by means of numerical models couched in the form of double-entry accounts. This method the author considers superior to sequence analysis, for it is allegedly less rigid and more suitable for working with figures of investment, production, etc., subdivided according to industries. In the course of expounding his methods the author introduces a number of theoretical investigations which take up a large part of the book. There are discussions of the savings-equals-investment problem (two chapters), the Ricardo effect, the concept of dynamic equilibrium, and Say's law. But the book is not remarkable for novel theoretical conclusions, and must be judged rather on the methodological issue. Most theorists will perhaps be doubtful of the value for theoretical research of the methods of double-entry bookkeeping, which is concerned to portray the sequence of events rather than their causal connections. There is a danger of failing to see the theoretical wood for the numerical trees.

Strukturwandlungen und Nachkriegsprobleme der Wirtschaft Belgiens. By GERHARDT PFEIFFER. Kieler Studien. Kiel. 1951. vi + 112 pp. Dm. 8.

This work surveys the structural changes and post-war problems of the Belgian economy. The main body of the book is divided into two parts: the first part deals with the structure of Belgian industry, paying especial attention to recent trends. The second part deals with the national income of the country, with wages, prices, investment, employment and currency problems, and with the Benelux Union. The survey is purely factual. It is concise, and written in a readable style.

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OR THROUGH ANY BOOKSELLER

Planning by Economic Survey[1]

By E. Devons

In the Economic Survey for 1947—the first of the Series—there was a general introductory chapter on " Economic Planning " explaining " The Kind of Plan " the Government had in mind, and " How the Plan is made ". This gives the main official indication of how the authors of the Survey thought, or wished the public to think, that planning would proceed. It is interesting to look back now at this exposition and examine how these ideas have developed in successive Economic Surveys. Unfortunately, no later Economic Survey contains a similar introductory chapter—it would indeed be of great interest to read what the authors of the Surveys would have written on " Economic Planning " as a preface to the 1952 Survey, after the lessons of the last five years. In the absence of this, one has to proceed by a process of detection. By examining how the treatment of various aspects of planning has changed from Survey to Survey, it might be possible to assess how the present system of planning compares with the exposition given in 1947. It is not my intention to examine in detail the accuracy and reliability of the various plans and forecasts that have been made year by year, fascinating though this might be. I am concerned rather to outline the changing content and methods of the plans given in the Economic Surveys.

I

In the Economic Survey for 1947 three sets of plans were envisaged. First, plans for individual industries ; second, economic " budgets " for man-power and national income and expenditure ; and third, analyses of particular problems, such as foreign exchange, investment, fuel and power, steel, timber and other scarce materials.

The main plans for individual industries were to be related to what were called ' basic ' industries. " There are a number of basic industries and services—coal, power, steel, agriculture, transport, building—the efficient development of which is fundamental to our entire productive employment. A long-term plan is being developed for each of these industries. It must be one of the chief aims of the Government's economic plan to see that these plans are pressed forward as fast as possible and kept in proper relationship with each other and with the rest of the economy" [1947 : 11].[1]

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[1] Apart from the references to the Survey for 1952, this article is based substantially on a lecture given to the Economics Society at the London School of Economics on March 13th, 1952.

The economic 'budgets' for man-power and national income and expenditure were to set out resources and requirements. "The man-power budget compares the estimated future working population with the number of workers required industry by industry. The national income and expenditure budget compares the estimated value of the national production of goods and services with the value of all the goods and services required" [1947 : 15]. "These economic 'budgets' are prepared by a central staff, working with representatives of the Government departments concerned under an official committee. On the resources side the Ministry of Labour forecasts the working population, and an estimate is made on the best evidence available about the prospective value of output. In regard to requirements, the position is less simple. Some, such as the man-power for the Armed Forces, originate within the Government machine. Others originate outside the areas of Government control, but are sponsored by Government departments . . . . others again, where no Government control operates, are estimates of what the market will claim" [1947 : 16]. There is no discussion of the significance of a statement of the relationship between supplies and requirements for the national product as a whole, where the requirements figure contains a large element "of what the market will claim". It is indeed difficult to discover what the authors had in mind when they refer to "the value of all the goods and services required".

The plans for particular sectors or commodities were to supplement these two general economic 'budgets'. "The foreign exchange statement compares our import requirements with our prospective income from exports, visible and invisible. Consideration of this statement, in relation to the rate at which we can afford to spend the United States and Canadian credits, provides the basis for deciding on the one hand the import programme, and on the other the export target. The latter is a claim on the man-power 'budget'" [1947 : 18]. "The investment statement compares the estimate of what is required to be spent on capital equipment and maintenance, with the labour and materials available for the industries which produce equipment, such as building and engineering". "It is also necessary to make sure that the plans under this head are consistent with the funds which are estimated to become available for financing capital work, which is an item in the national income 'budget'" [1947 : 19]. "The statements for fuel and power, steel and other scarce materials show the effect on the whole economy of shortages of these basic supplies" [1947 : 20].

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[1] The references are, throughout, to the numbered paragraphs in particular Economic Surveys.

The authors of the 1947 Survey explained that when these separate budgets had been drawn up, they had to be made to fit. It would not be sufficient to allocate supplies between the various requirements so that the totals agreed for each budget; each budget had also to be reconciled with the rest, so that the budgets as a whole gave a consistent basis for planning for the coming year. There is little discussion of how this—the most difficult problem of planning—was to be achieved. The only indication of how the coordination of the individual plans was to be secured is given in the following paragraph. "Planning the allocation of resources between the various national requirements is at present a task of deciding which out of a number of claimants must go short—in other words, which are the most important national priorities. It is precisely the same problem, only on a national scale, as the housewife has to solve every week. On the one side are the resources which we have to spend, on the other side are the things upon which we want to spend them. The two must be made to match. After full examination of possible means of attaining a balance, the official committee submits to Ministers a report on what measures should be taken and their decisions form the basis for subsequent action" [1947 : 25].

II

These extracts from the Economic Survey for 1947 show the authors' views at the time of the theoretical structure of planning. Even then there were expressions of doubt and hesitation about the significance and usefulness of such plans and especially about the difficulties of implementing them. But remarkably little was said about the intrinsic difficulty of drawing up correct and consistent plans; the emphasis was rather on the difficulty of implementation because the Government wished to proceed by 'democratic' rather than 'totalitarian' methods. "The apparatus of Government controls is used to guide the economy in the direction which is indicated by the plan. This control apparatus, taken as a whole, can have a substantial effect upon the course of the national economy. But the controls cannot by themselves bring about very rapid changes or make fine adjustments in the economic structure. To do this, they would have to be much more detailed in their application and more drastic in their scope. Indeed, the task of directing by democratic methods an economic system as large and complex as ours is far beyond the power of any Government machine working by itself, no matter how efficient it may be. Events can be directed in the way that is desired in the national interest only if the Government, both sides of industry and the people accept the objectives and then work together to achieve this end" [1947: 27]. How the Economic Survey helps the individual or the firm to decide what he should do to make the plan succeed, assuming that he is anxious for its success, is left a mystery. Beyond the knowledge that he should work hard (or should he really do this if he is in an unessential industry?), not press for higher wages, salaries or profits and save a lot, he is given no criteria to guide him in deciding what to do to make the plan succeed. This view of the plan as a framework drawn up by the Government which requires everyone to do voluntarily what is necessary for its success, remains a rather nebulous one.

III

The Economic Survey for 1947 did not in fact give all the budgets and plans which were discussed in the introductory chapter on the system of planning. Specific output plans were given only for coal, electricity (generating plant), shipbuilding and building. There were also general budgets for foreign trade and labour. But on capital investment and national income and expenditure—which became the central features of some of the later Surveys—only summary information was provided. This merely gave the percentage distribution of fixed capital investment during the coming years between various activities, and the distribution of the national output between consumption, public expenditure, capital investment, and overseas trade. In no sense could these have been called budgets, showing the relationship between requirements and resources; they were merely forecasts of what was expected to happen, and then not in a very helpful form.

The full flowering of the 1947 Survey system of planning did not come until the Surveys for 1948 and 1949. In the Survey for 1948 detailed production plans were given for a wide range of specific commodities, import and export programmes were given in some detail, and there were summary estimates for capital investment and man-power distribution. But the most important innovation was the introduction of an analysis of national income and expenditure and a detailed discussion of the problem of inflation.[1] The national income and expenditure plans were presented in three stages. First, an estimate of national output, the foreign balance and the total of resources available for home use, the latter being subdivided between personal consumption, government expenditure and home investment. Then a statement of expected current public expenditure and revenue on the basis of existing rates of taxation, from which was derived a figure of the prospective public authorities' surplus or deficit. And lastly, an analysis of the national capital account which compared expected total investment with the sources available to finance it. In this statement at first private savings and later personal savings were treated as the residual item, and the question was asked whether this level of savings could be expected to occur voluntarily. It was around the situation as portrayed by these Tables that the problem of inflation was discussed in the Survey for 1948 and later years.

IV

It is now proposed to examine what happened to these various plans and programmes in later Surveys; to see what remained in the later Surveys of the theoretical structure outlined in the Surveys for 1947 and 1948.

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[1] Although the 1947 Survey was full of statements indicating that our resources were not enough for everything that we wanted to do, this was not treated as a symptom of an inflationary situation. Indeed, the word inflation was not mentioned.

(*i*) *Plans for Individual Industries*

In the Survey for 1948 individual production or capacity targets were given for coal, mining machinery, electricity, oil, steel, transport (locomotives, wagons and carriages, track laying, commercial and public service vehicles and shipbuilding), textiles (cotton, wool and rayon), and agriculture. In 1949 the targets for transport and oil had disappeared, but estimates of the expected consumption of a wide range of raw materials were added. These were continued in the 1950 Survey but in the 1951 Survey the raw material figures related only to actual and not to expected consumption, and no targets were given for textile production. So that by 1951, specific industry targets had been narrowed down to figures for coal, steel and agricultural production. Even more significant than the narrowing down of the planned figures given, is the change in the way in which the plans for individual industries were discussed. The major part of Chapter II of the Survey for 1951, which deals with individual industries and products, is concerned with reviewing the recent events and existing problems of industry—coal, electricity, steel, raw material supplies, building, textiles and agriculture. The glimpses into the future are brief, tentative and hesitant, and even where figures are suggested for the coming year they are hedged about with numerous qualifications. A typical example of the vagueness of the plans, even when figures were given, is the following statement about the steel plan in the Survey for 1949. " It is accordingly possible to arrive at a variety of views on the probable steel output—from the pessimistic which would assess the figure at less than the 1948 output, to the highly optimistic based on full capacity of the furnaces. The objective is the maximum output the industry can achieve with the materials it can obtain. In the most favourable circumstances this should be between 15¼–15½ million tons of ingot steel " [1949 : 27].

By 1951 this section of the Survey was much more a review of the recent past than a plan for the future.

(*ii*) *The Man-Power Budget*

The Man-Power Budget was one of the first casualties as the Surveys progressed ; indeed, it hardly ever came to life. The Survey for 1947 had explained that the budget would " compare the estimated future working population with the number of workers required industry by industry ". A budget of this kind was not in fact given in any of the Surveys. In the Survey for 1947 there was an estimate of the total working population at the end of the year and its distribution by the main industrial groups. But it was explained that " this is neither an ideal distribution nor a forecast of what will happen ; it represents the approximate distribution which is needed to carry out the objectives in paragraph 18 and which the Government considers can be achieved if the nation as a whole sets itself to achieve them " [1947 : 128].

Similar figures of the total labour forces and its distribution by industries were given in the Survey for 1948, but the explanation of the significance of these ' forecasts ' was now rather different. " Any projected distribution (of man-power) is therefore largely a forecast of the results of other factors and if some figures turn out differently it is not necessarily in every case a matter of regret.[1] But the labour forces proposed for coal, agriculture and textiles are targets in the full sense " [1948 : 186].

The figures of man-power distribution by the end of the year were given again in the 1949 Survey, but now " a target in the full sense ", was given only for coal-mining. For although increases of 11,000 in cotton and 6,000 in wool are shown in the Table, the Survey states that " an improvement on these figures would be desirable " [1949 : 91]. The Table giving a forecast of man-power distribution reappeared in the Survey for 1950, but all reference to targets for specific industries had disappeared. And by 1951 this general table was also omitted. The omission went almost unnoticed and no regret was expressed by the authors of the Survey at this rather sorry ending of the attempts to include a man-power budget as an essential element in the plan.

Man-power issues were not ignored in the 1951 Survey. The discussion centred round the problems of obtaining the man-power needed for the rearmament programme. Although some estimates of the labour force required for this were given, the treatment was largely qualitative, and no attempt was made to show in a man-power budget where the labour for armament production was to come from.

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[1] We are not told in which cases it would not be a matter for regret if the figures turned out differently.

(iii) *Foreign Trade and the Balance of Payments*

Since the beginning of the Series, events have forced discussion of problems of foreign trade and the balance of payments into a central position in all the Economic Surveys. Yet the difficulty of forecasting the foreign trade situation for any length of time ahead was recognised at a very early stage. The pattern of trade that would be necessary in the long run could be sketched in broad outline, and a reasonably reliable detailed estimate could be made of the balance of payments for a few months ahead; but to forecast the foreign trade situation for the intermediate period of a year to eighteen months ahead implied an assessment of the timing of fluctuations in international trade which proved quite impossible. The sections on foreign trade became more and more a detailed review of the nature of the United Kingdom and sterling area balance of payments problems with general suggestions as to how these should be tackled, than anything in the nature of the firm programme for foreign trade envisaged in the Survey for 1947. Even on the import side, where the Government exercised a substantial measure of control, it proved impossible to lay down a firm programme for more than a very short period ahead.

Such attempts as were made in the Economic Surveys to draw up foreign trade programmes showed also that the Spring of each year—when the Surveys were issued—was not a particularly appropriate time to take planning decisions in this field. International events, such as the grant of E.R.P., the devaluation of non-dollar currencies, or a change in the economic situation in the United States, paid little respect to the calendar, and thus it was impossible to reserve for the Economic Survey discussion of the major decisions in foreign trade policy. Nor did the review of the foreign trade situation in the Economic Surveys enable the planners to foresee, let alone anticipate, some of the major changes in international trade which affected the external position of the United Kingdom. The mounting hesitations with which estimates for the future were put forward can be seen from the following brief account of the foreign trade statements in successive Surveys. In the Survey for 1947 estimates of imports, net invisible income, planned borrowing, and exports—as a residual—were put forward for the whole of the coming year. In the Survey for 1948 even more detailed export targets were given for groups of industries and markets, but an import programme was given for the first half of 1948 only. " Import programmes for the second half of 1948 have not yet been finally decided. These must inevitably depend on decisions about the European Recovery Programme " [1948 : 31]. Even the figures for the overseas balance for the first half of the year derived from these import and export programmes were put forward with great hesitation. " These estimates are, however, subject to a considerable margin of error. It is not possible to predict with great accuracy either the difference between total payments and receipts, or the distribution of exports between the sterling area and the rest of the world " [1948 : 70].

In the Survey for 1949 estimates, although in considerable detail, were again given only for the first half of the year. The reason given on this occasion was also the uncertainty of the volume of E.R.P. aid. In the Survey for 1950 all detailed estimates of export targets, imports and the foreign balance for the coming year had disappeared. There was a long detailed discussion of the course of events in 1949, and of the proposals put forward in the Long Term Programme submitted to O.E.E.C. for bringing the sterling area external accounts into balance by 1952–3 ; but very little about 1950. " It is particularly difficult to forecast how much progress will be made in 1950 because the devaluation of last September has profoundly affected every aspect of the balance of payments, and until more time has elapsed it is impossible to disentangle the short-term from the more permanent effects. Any attempt to do so now in the form of apparently precise statistics would be seriously misleading " [1950 : 46]. Further factors quoted by the authors as making the future especially uncertain, were the dependance of the future course of raw material prices on the course of United States activity and the liberalisation of trade between this country and the other members of O.E.E.C.

The Economic Survey for 1951 also avoided giving any detailed foreign trade programmes. It was argued that because of " the discussions which are now proceeding in N.A.T.O. in order to provide for an equitable distribution of the economic burden of defence, . . . and because of the rapid changes which are now in progress, it is impossible to make detailed forecasts of the development of our external position in 1951 and subsequent years" [1951 : 87]. "The general character of the problems before us can, however, be clearly indicated" [1951 : 87].

As a consequence of the events of 1950 there was much more discussion in the Survey for 1951 than in earlier Surveys of the importance of movements in the terms of trade. This issue had been avoided in earlier Surveys by assuming the terms of trade to remain unchanged, but such an assumption was no longer possible. Any precise forecasting of the terms of trade was, however, avoided by working out a figure for the required value of total exports in 1951, but not indicating how far this was to be met by an increase in prices and how far by an increase in volume.

The events of 1951 have demonstrated perhaps even more conclusively than those of earlier years the great difficulty of forecasting our changing overseas fortunes. Although the 1951 Survey portrayed the overseas position as critical, there was no inkling even of the possibility of the disastrous change in the balance of payments which took place in the second half of the year.

(*iv*) *Capital Investment*

The attempts at capital investment planning in the early Economic Surveys was dogged by misfortune. Presumably two purposes were to be served in drawing up a capital investment plan. A detailed programme would apportion capital investment according to 'social priorities', and a plan for investment in total was necessary as an essential part of the national income and expenditure accounts. A detailed statement of proposals for capital investment in a wide range of industries was given in the White Paper on Capital Investment in 1948,[1] issued at the end of 1947. Similar statements appeared in appendices to the Surveys for 1949 and 1950. In spite of this detail, however, it was never made clear—perhaps it is not possible to make clear—by what criteria the choice of investment projects was made. In most cases there was just a statement of the amount of investment in the particular industry which the Government proposed to allow. These proposals seemed to be based on *ad hoc* decisions in each case. In the event, the individual investment plans bore little relation to what actually happened. Usually the sectors where investment was planned to increase, increased less than the plan; and where reductions were called for, the reduction did not fully materialise.

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[1] Cmd. 7268.

It is doubtful whether the publication of the detailed plans served any useful purpose except to show the basis on which the estimate for total investment was arrived at. This is recognised by implication in the following comment on the detailed plans given in the Survey for 1949. "The sum of these estimates suggests an increase of some £120 million in 1949. But past experience has shown that, however carefully the estimates for work to be undertaken may be drawn up, the investment actually achieved will be less than the programme as a result of unforeseen difficulties and delays. It is impossible to say in advance which programmes will be affected. . . " [1949 : 45]. In any event, the detailed statement of investment plans was discontinued after the Survey for 1950.

The total of all the specific programmes did not add to the total of investment which had to be allowed for in the National Income and Expenditure estimates, since there were important fields of capital investment which were not covered in the detailed statements. The amount of investment in fields outside the planned items was grossly underestimated in the Survey for 1948, partly through ignorance of the volume of work done on repair and maintenance. The Survey for 1948 gave £1,420 million as the amount of fixed investment planned for the coming year, in ignorance assumed that this covered the whole field of fixed investment and merely added another £380 million to cover the expected rise in prices, stocks, and work in progress.[1] This gave a total of £1,800 million for home investment—the figure used in drawing up the capital account in the national income and expenditure statement. In fact, investment in 1948 turned out to be £2,352 million.[2] This substantial difference was only partly due to the fact that fixed investment increased even though the plan called for some reduction and because prices rose more than had been allowed for. A good deal of the discrepancy arose from the fact that the plan did not cover the whole field of investment.[1]

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[1] The figure of £380 million also covered the increase in exports not yet paid for, since at the time this was included in "home investment".

[2] This is the figure given in the 1948 National Income White Paper. It was revised to £2,590 million in the White Paper for 1949.

This gross error was remedied in the 1949 Survey, when £370 million was included to cover miscellaneous items of investment not specified in detail. As a consequence the total of fixed investment which materialised in 1949 was much closer to the Survey estimate. Yet if one added to this miscellaneous item the estimate which had to be made for stocks and work in progress—admittedly one of the shakiest estimates in the Survey[2], the proportion of the total of investment which could be estimated with any pretensions to precision was not much more than half the total. Thus in the Economic Survey for 1949 programmed investment accounted for £1,755 million out of a total estimated home investment of £2,330 million. In the Survey for 1950 planned fixed investment was still discussed in some detail, but there was no indication of how the authors had proceeded from the figure of £1,786 million for this item to the £2,435 million given for "gross capital formation" in the national income tables. It was not possible to discover what had been assumed about the movement of miscellaneous investment, price changes, and the movement of stocks and work in progress. As has already been mentioned, no detail figures of prospective fixed investment were given in the 1951 Survey; but the figure given in the National Income forecasts showed fixed investment and the increase in stocks and work in progress separately for the first time. But this attempt to allow more precisely for stock changes was not particularly successful. This is hardly surprising in view of the paucity of information about actual stock changes and the unpredictable nature of stock movements. Indeed, it is very doubtful whether stock movements which are

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[1] That this was so can be seen clearly by comparing the estimate of actual fixed investment in 1947 given in the Survey for 1948—£1,550 million—with the figure for 1947—£1,800 million—published a few weeks later in the National Income White Paper for 1947.

[2] It is not merely the forecasts of the movements in this item which were subject to a wide margin of error, but also the estimates of what had actually happened after the event. This can be seen from the following figures for this item from the National Income White Papers for 1949 to 1951.

Figures given in National Income White Papers for :	*Value of Physical Increase in Stocks and Work in Progress.* £ million			
	1948	1949	1950	1951
1949	75	150	—	—
1950	200	215	115	—
1951	280	325	204	370

highly sensitive to changes in prices and the general economic climate can ever be ‘ planned ’ in advance. And yet such movements may form an important element in the total of home investment.

The experience of attempts to plan the total of home investment has also shown the difficulty of estimating at all precisely in terms of a calendar year the effect of Government measures to encourage or discourage investment. Much investment has to proceed on a long-term basis and the rate at which it takes place cannot easily be changed at short notice. This is clearly recognised in the following comment on prospective building investment in the Survey for 1951. “ The planning and execution of most building works take a considerable period, and to be effective the control of investment programmes must look far ahead. The investment programme for 1951 was prepared and approved in 1950, and account was then taken of the probable increase in the total output of the building and civil engineering industries. Much of the work allowed for in this programme, particularly that to be carried out in the early part of 1951, was licensed and, in some cases, even begun during 1950. Some of the other work may, however, have to be deferred in order to give priority to specific defence projects where this is necessary to avoid overburdening local building resources. At the same time it will be necessary to reduce the total programmes of civil investment in 1951 and 1952 in order to make room for further defence building work. These are being re-examined and until the examination is completed it will be impossible to say how large the cuts in civil investment will be, or where they will fall ” [1951 : 76].

(*v*) *National Income and Expenditure*

National income and expenditure accounts were used for the first time in the Survey for 1948, as a method of portraying the general economic situation in the coming year. The calculations made in that Survey proceeded on the assumption that by drawing up such a system of accounts it was possible to discover whether the situation was likely to continue to be inflationary, and if so the magnitude of the inflationary gap. “ It is now possible to build up an estimate of the total national income and expenditure. From this we can judge whether the total of what we are attempting is or is not within the limits of our overall resources and whether any measures are necessary to limit some of the expenditure, and reduce it to a better balance with the expected output from available resources" [1948 : 97]. The Survey posed the problem of the inflationary gap in terms of a hypothetical balance sheet of capital expenditure and the sources available to finance it, with personal savings as a residual item. The authors then asked whether this required level of personal savings was likely to occur. As an aid to answering this question, the required personal savings were calculated as a percentage of total disposable income, and this was compared with similar percentages for 1946 and 1947, and 1938. It was then concluded that "when allowance is made for these factors,[1] which did not prevail to anything like the same extent in 1938, it is unlikely that, without a radical change in the willingness of individuals to save, the total of net saving in 1948 in the absence of inflation, will reach the necessary figure".

Leaving on one side the extremely tenuous basis on which these figures are calculated—it is recognised in the Surveys that they involve estimates which are little more than guesswork—it is worth while enquiring whether in principle calculations of this sort can in fact tell us whether the future economic situation is going to be inflationary or not. In my view it is a complete misunderstanding of the nature of these estimates to expect them to yield forecasts of this sort. In making the estimates themselves one has to make implicit assumptions as to the continuance of inflation; and it is not surprising that if inflationary assumptions are made in these individual estimates, the resulting accounts will portray an inflationary situation. Thus if one starts with an inflationary situation and assumes that investment will be at a high level in the coming year and will be limited only by physical controls, if one assumes that the pressure of consumer expenditure will be such that it will need to be restrained by rationing, and if one assumes that increased Government expenditure will not be matched by higher rates of taxation, it is hardly surprising that a system of national accounts drawn up on these assumptions results in a residual figure of personal savings which is not likely to be forthcoming voluntarily. The judgment about the degree of inflationary pressure which is likely is part of the calculating process—it is implied in the assumptions made about the level of investment, consumption and Government expenditure, it does not emerge as the final result of the whole exercise. In any case, when the situation was clearly inflationary, as in 1948 and 1951, the calculations added little to our information ; and when the future economic climate seemed to be doubtful, as in 1950 and 1952, the national income accounts appeared to give practically no help in deciding which way the scales were likely to tip. It is when we are on this razor edge, with some forces still inflationary but others working in a deflationary direction, that it would be most useful to know what is going to happen, and yet it is just in such a situation that it is most difficult to make plans or forecasts.

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[1] "The desire of many persons to use their past savings to re-equip themselves with durable consumption goods" . . . and also to use "past savings to maintain standards of expenditure greater than present taxed income will permit".

At most the estimates of the national accounts are a useful framework within which to discuss these problems. They make implicit the assumptions that are being made and they may prevent us overlooking some important interrelationships which might otherwise be neglected. But to think that they can provide the basis for deciding how big a budget surplus or deficit the Chancellor should aim for in his Budget, is grossly to exaggerate their importance. An assessment of the force of inflationary or deflationary tendencies continues to be a most difficult exercise in the examination of all the information—quantitative and qualitative—available about the economic situation, both at home and overseas.

One can trace some degree of recognition of this view in the later Economic Surveys. The Survey for 1950 states that " the analysis which follows (of national income and expenditure) is based on a number of stated assumptions. The selection of these is a matter of judgment, and the most important depend on a sense of responsibility shown by the people as a whole to the needs of the situation. With different assumptions, the conclusions would be different " [1950 : 68]. In assessing the future economic situation, the Survey for 1949 paid less attention to the national income accounts, and much more regard was given, in traditional fashion, to the movement of certain key economic indicators. Since 1949 this form of analysis has been extended and in 1951 reference was made to the level of unemployment, the movement of prices and stocks, the level of bank advances and the rate of interest, in assessing the extent to which inflationary pressure had been brought under control in the previous year.

Experience has also demonstrated that inflationary pressure which results from a costs/prices spiral cannot be adequately portrayed in a set of national accounts. In the earlier Economic Surveys this problem was completely avoided by giving the National Income and Expenditure estimates in terms of the prices ruling at the end of the previous year. There was, of course, an appeal for restraint in pressing for higher incomes and prices, but no attempt to embody an assessment of the likely degree of success of these appeals in the system of national accounts for the coming year. Yet of course wage/price movements played a crucial part in determining how the allocation of resources in fact turned out in any particular year. Only in the 1951 Survey was some attempt made to include income and price movements in the forecast for the coming year, and the basis on which this was done has since proved pitifully incorrect.

V

By the Survey for 1951 a good deal of the planning system portrayed in the first Survey had disappeared.[1] The manpower budget had gone completely; there were now no details of investment plans; the plans of production in specific industries were limited to a very narrow range; forecasts for foreign trade were given for only a short time ahead, and then in the most hesitant terms. Forecasts of the national income and expenditure still remained, but they were hedged round with numerous qualifications at every stage. Yet it was these accounts which commanded most attention when the Survey was published, for they bore on budgetary policy more closely than any other section of the Survey.

The result of this gradual whittling away of the forecasts and plans given in the Survey, was to turn the document more and more into a review of the economic events of the previous year and less and less of a clear set of plans for the coming year. The Survey for 1952 completed this process. Practically all reference in statistical terms to plans for the coming year had disappeared. The major part of the Survey was devoted to a review of the changing economic situation since the middle of 1951. The measures which the Government had taken or proposed to take to deal with our economic problems were explained, but the effect they were expected to have in the next twelve months was outlined only in the broadest terms. Even the forecast of national income and expenditure was no longer given, although there was some reference to a few crucial figures in the section on " The Balance of the Economy in 1952 ". The almost complete disappearance of specific programmes for the future in the 1952 Survey can perhaps be explained in terms of the political complexion of a new Government and its anti-planning philosophy. On the other hand it could be viewed merely as a further stage in learning how difficult it is to put forward precise plans for the future in the Spring of each year—a process of learning which has been going on continuously since 1948.

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[1] Disappeared from the published documents; some of the plans which are no longer published may, of course, still be constructed and circulated in Whitehall.

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A Rehabilitation of the Classical Theory of Marginal Utility[1]

By H. BERNARDELLI

> "There marched the Emperor in the procession under the beautiful canopy, and everybody in the street and at the windows said: 'Goodness! The Emperor's new clothes are the finest he has ever had. What a wonderful train! What a perfect fit!' No one would let it be thought that he couldn't see anything, because that would have meant that he wasn't fit for his job, or that he was very stupid. Never had the Emperor's clothes been such a success.
>
> 'But he hasn't got anything on!' said a little child."
>
> —HANS CHRISTIAN ANDERSEN.

I

The profound changes which have been introduced into the theory of value during the last two decades were inaugurated mainly in the belief that the classical structure of economics was incompatible with the ordinal nature of utility. This belief, however, is mistaken. It will be proved in what follows that the corpus of classical doctrine as presented at its best in the mature formulations of Philip Wicksteed, or in the concise and elegant groundwork of Sir A. L. Bowley, contains not a single proposition that would need amending on account of the fact that utilities can only be ordered by ranking, but not by measuring. The author is aware that these assertions are completely at loggerheads with current opinion. Yet he will establish the point that the current beliefs are the result of a simple, inconspicuous error which at first is difficult to spot, but which is really quite trivial and easily eliminated once it has been recognised.

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[1] A lecture given in Professor L. Robbins' Seminar at the London School of Economics (November 27th, 1951).

It will be remembered that Edgeworth was the first to describe the indifference field of a person by means of one-parametric functions such as

$$U(\xi, \eta) = -a\xi^2 + 2h\xi\eta - b\eta^2 + 2g\xi + 2k\eta = \text{const.}, \quad \ldots\ldots(1)$$

where ξ and η are commodities, and where the constants a, b, g, and k are in general assumed to be positive, while h could be $\gtreqless 0$. (It does not affect the generality of the argument, if for the sake of simplicity we consider two commodities only, and select a quadratic form as a suitable example of a function which generates an indifference field.) Edgeworth then proceeded to express the conditions of increasing total—and of decreasing marginal—utility by means of the relations

$$\frac{\partial U}{\partial \xi} = 2(-a\xi + h\eta + g) > 0, \quad \frac{\partial U}{\partial \eta} = 2(-b\eta + h\xi + k) > 0, \quad \ldots(2)$$

and

$$\frac{\partial^2 U}{\partial \xi^2} = -2a < 0, \quad \frac{\partial^2 U}{\partial \eta^2} = -2b < 0 \quad \ldots\ldots\ldots(3)$$

Finally the cross-derivative

$$\frac{\partial^2 U}{\partial \xi \partial \eta} = \frac{\partial^2 U}{\partial \eta \partial \xi} = 2h \gtreqless 0 \quad \ldots\ldots\ldots\ldots(4)$$

signified in his system whether the uses of the two commodities were complementary, independent, or rival to one another.

It is evident from these formulæ that Edgeworth considered utility and the function U which generates the indifference field *as one and the same thing*. Pareto followed him in this respect and referred to the function U as the index of *ophélimité*. But this identification leads to a very awkward dilemma. Utilities can enter into the equations of economics only as *intensive* magnitudes, and if U were an ordinal index of utility, then any monotonic transform of U would have the same right to serve as an index. But when we select arbitrarily a function $F(u)$, subject merely to the condition $F' > 0$, we find that only the relations (2) remain undisturbed. The second order derivatives in (3) and (4) will, after transformation, not necessarily give the same indication. In fact the relations $\frac{\partial^2 U}{\partial \xi^2} < 0$ and $F' \cdot \left(\frac{\partial^2 U}{\partial \xi^2}\right) + F'' \cdot \left(\frac{\partial U}{\partial \xi}\right) < 0$, etc., will generally be co-existent only when $F'' = 0$. But such a severe restriction on the choice of F would make nonsense, of course, of the ordinal nature of utility. If this restriction were valid, we should in fact be in possession of a cardinal measure. Thus, by *identifying* utility with the generating function U, the appearance is created that *either* we are talking nonsense when we speak of decreasing marginal utility and of complementarity in the classical sense, *or* that we (illicitly) assume utility to possess a cardinal measure. *Prima facie* this disjunction is not very plausible.

In view of this dilemma the obvious question arises whether the function U is really a suitable index of utility. Yet it appears from the literature that this question has never been even raised. This is all the more surprising when one considers that U itself plays only a very auxiliary role in the deductions of mathematical economics. The magnitude with which Edgeworth, Pareto, and all the other classical writers were primarily concerned is the difference

$$U(\alpha + x, \beta + y) - U(\alpha, \beta) = f[(\alpha, \beta);\ (x, y)] \quad .. \ (5)$$

—a function in two sets of variables, where the first set $(\alpha, \beta, \ldots)$ denotes the initial position of the individual, whereas the second set $(x, y, \ldots)$ stands for the quantities that are being exchanged or otherwise acquired. And still more surprising: this difference function f does not lead to the previous dilemma. Assuming U again to be of the form (1), the relations (2) – (4) express themselves in terms of f as

$$\left.\begin{aligned}
\frac{\partial f[(\alpha, \beta);\ (x, 0)]}{\partial x} &= 2[-a(\alpha + x) + h\beta + g] \\
&= \left(\frac{\partial U}{\partial \xi}\right)_{\substack{\xi = \alpha + x \\ \eta = \beta}} \\
\frac{\partial f[(\alpha, \beta);\ (0, y)]}{\partial y} &= 2[-b(\beta + y) + h\alpha + k] \\
&= \left(\frac{\partial U}{\partial \eta}\right)_{\substack{\xi = \alpha \\ \eta = \beta + y}} \\
\frac{\partial f[(\alpha, \beta);\ (1, 0)]}{\partial \alpha} &= -2a = \frac{\partial^2 U}{\partial \xi^2}, \\
\frac{\partial f[(\alpha, \beta);\ (0, 1)]}{\partial \beta} &= -2b = \frac{\partial^2 U}{\partial \eta^2}, \\
\frac{\partial f[(\alpha, \beta);\ (1, 0)]}{\partial \beta} &= \frac{\partial f[(\alpha, \beta);\ (0, 1)]}{\partial \alpha} \\
&= 2h = \frac{\partial^2 U}{\partial \xi \partial \eta} = \frac{\partial^2 U}{\partial \eta \partial \xi}.
\end{aligned}\right\} (6)$$

It is evident that all the conditions concerning utility can be stated in terms of first order derivatives of the function f, and *that they are invariant*, if we chose to replace f by some monotonic transform $F(f)$.

Are we entitled then to the conclusion that the whole dispute about the measurability of utility has been spurious from the beginning to the end ? That the crux of the matter really consisted in the rejection of Edgeworth's naive identification of utility and the generating function U ? That all the surgical operations that have been undertaken in order to bring economics in line with the unquestionably ordinal nature of utility have been pointless ? I am afraid the answer to these questions is in the affirmative. The evidence provided by the equations (6) is in itself conclusive. But in order to allay possible suspicions of the reader that I am trying here to put across an outrageous bit of mathematical trickery, I shall give independent reasons to show that the function f qualifies as an index of utility, whereas the claims of the auxiliary function U have to be rejected.

II

Marginal utility theory is concerned with the valuation of concrete quantities of goods, and only in a remote and rather indirect sense does it deal with " positions " that are preferred to one another. If a person goes to a market and purchases x units of a commodity at a price π, then the theory is interested in the intensity of demand which—while deciding whether to buy or not to buy—this person feels for the quantities x and $-\pi x$. His judgment of the value of his purchase always refers to a bundle of goods, and it will be convenient for the purpose of clear exposition to consider this bundle as a vector magnitude. For short I shall call it the quantity vector $q = (x, -\pi x)$. If the person happens to buy other goods as well, then the quantity vector q has, of course, more than two components. Now the first fundamental assertion of marginal utility theory is the statement that the value which a person attaches to a collection of goods enumerated in a quantity vector, varies directly with the size of the vector components. This is merely common sense : a larger portion of some good is valued more, in general, than a smaller portion. Where this is not the case, we speak of encumbrances rather, not of goods.

The second trivial, but equally fundamental, assertion of the theory consists in the observation that the economic value judgments of a person are not only influenced by the vector of commodities which he intends to acquire, but also by the circumstances under which his choice is made. These circumstances can be enumerated, and the enumeration may be conveniently described as the position vector p of this person. This vector will have a great many components. The person may hold e.g. stocks of commodities which have an important bearing upon his decisions in the market. But the components of the position vector are not necessarily quantities of goods. When some kind friend presents me with a pound of butter, while I am staying in England, my heart leaps with joy. But let the spacial components of my position vector be turned by 180 degrees so that it points to New Zealand, then I would value the gift of a pound of butter merely with a mild and somewhat incredulous surprise. My judgment of the value of q depends essentially upon the position vector p. In short, an economic value judgment *necessarily* contains two sets of variables; it is a function of the form $f(p, q)$.

This is a most convenient notation for economic valuations, and it will be used throughout in this paper. To avoid misunderstandings the reader will do well to bear in mind that the first variable in this function $f(p, q)$ always refers to the conditions under which the second variable, the quantity vector q, is being valued. This being understood it follows that $f(p, 0) = 0$ is a formula that makes sense and is actually true. Because, whatever my position, when there are no goods to be valued the intensity of my desire for the null-vector is zero. By contrast the converse formula $f(0, q)$ hardly makes any sense, unless we chose to interpret it in a forced and facetious manner as the craving which a person may experience for a bundle of goods when he is placed in a position of the naked void. But then the valuation is not relevant for market behaviour: on a market one values goods always from positions $p \neq 0$.

Consider now figure 1. From the origin O two vectors p_a and p_o radiate which are meant to describe the initial and the final position of a person in a market. The line (a, o) is as usual the opportunity line at the price π.

The person comes to the market with the quantities $(\alpha, \beta) = p_a$. He leaves the market satisfied when he has reached the position $p_o = (\alpha + x, \beta - \pi x)$, i.e. when he has purchased x at the price π. His problem is to select the right amount of x, i.e. to determine that quantity vector $q = (x, -\pi x)$ which makes his value $f(p_a, q)$ a maximum.

Let ϵ be the smallest quantity of the good that conventionally can be purchased. If the person should buy only $x - \epsilon$, he would stop short of his optimum; if he should buy $x + \epsilon$, he would overshoot the mark. The vector $q_m = (\epsilon, -\pi\epsilon)$ may be called the marginal purchase. Let it be represented in figure 1 by the distance between the points o and + 1 that are marked on the price line. Obviously the optimum vector q_o can then be characterised by the relations

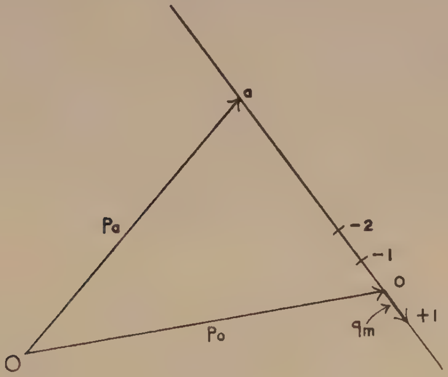

FIG. 1.

$$\ldots < f(p_a, q_o - 2q_m) < f(p_a, q_o - q_m) < f(p_a, q_o) > f(p_a, q_o + q_m) > \ldots \qquad \ldots\ldots(7)$$

There is nothing new in these relations; they describe what we mean by maximising utility under given circumstances.

But there is still another important way of characterising the optimum vector that must not be forgotten. Having reached the position $p_o = p_a + q_o$, the person may be in doubt whether a further marginal purchase is worth while. Then he has to ask himself whether or not $f(p_o, q_m) > 0$. And similarly it can be decided from any other position p whether the acquisition of an incremental q_m is desirable or not. Writing $p_{-2} = p_o - 2q_m$, $p_{-1} = q_o - q_m$, etc., one will have in general in the neighbourhood of the optimum position

$$\ldots > f(p_{-2}, q_m) > f(p_{-1}, q_m) > 0 > f(p_o, q_m) > \ldots, \qquad \ldots(8)$$

i.e. the values of successive marginal increments will be ordered. I hope the reader will see nothing unfamiliar in these relations; they merely describe what is meant by vanishing marginal utility. It should be noted that the inequalities (7) and (8) are not equivalent to one another. Reflection will show that (8) is the stronger principle.[1] In fact (8) implies (7), but the reverse is not true. In (7) quantity vectors of different sizes are valued from the same position; in (8) it is the same quantity vector that is being valued, but each time from a different position.

I learned all this in the nursery. My mother had two methods of determining the right amount of delicious food which she ladled on to my platter. The first method proceeded according to the inequalities (7), and I was requested to say " when ". But often it happened that childish greed and feebleness of judgment delayed the signal much too long. Then my mother used to say: " Your eyes seem to be bigger than your stomach. Just finish what you have got. You may always have another helping." And thus she made me switch over to experiment according to the inequalities (8). It was not long before I learned to observe and to anticipate the ravenous desire felt for the initial helpings, and the steady decline of my urge for more, when portion was added to portion. Later, in the University, I was as pleased as the Bourgeois Gentilhomme when I heard that the underlying principles of my nursery experience were those of increasing total—and of decreasing marginal—utility. And I learned to illustrate these sublime principles by queer sorts of diagrams which were as illuminating as they were innocuous, and which vividly recalled my drawings in childhood.

There was, however, in these exercises one point which my teachers possibly did not explain with sufficient clarity. Recent history of economic doctrines has shown that this omission has led to disastrous results. They did not drum it into our heads that the two words " total " and " marginal " utility did *not* refer to *two different species* of utility. They may have felt that such merely semantic observations were belabouring the obvious. For in those days of pre-scientific bliss it seemed to be generally understood that there was *one kind* of value judgment, only that it referred sometimes to bulky collections of goods, sometimes to marginal purchases. Little did my teachers know that soon a generation of economists would arise who seriously maintain that on the one hand there is a species of total utility which can be transformed monotonically and ordinalised, whereas another species, marginal utility, has to be exorcised at all cost as it leads straight to the cardinal sin of measurement. But then my teachers had no command of the austere and awe-inspiring language of mathematics to aid and to abet them in such barbarous confusion. It is true that Jevons and Edgeworth always wrote $U(x, y)$ for total and $(dU/dx)dx + (dU/dy)dy$ for marginal utility. But such cryptic formulæ certainly did not seem to call for much comment beyond the statement that their use was a peculiar idiosyncrasy of these authors.

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[1] The maximum principle requires merely that on the left side of the optimum one should have simultaneously $f(p_{-2}, q_m) > 0$ and $f(p_{-1}, q_m) > 0$, and the corresponding valuations < 0 on the right-hand side. The specific contribution of the marginal utility principle is the assertion that these valuations are ordered also in respect to one another, i.e. that $f(p_{-2}, q_m) > f(p_{-1}, q_m)$, etc., holds.

Alas, those days are gone! Economics has now become a Science. And now one has to explain the confusion that lurks behind formulæ of this kind. Now one has to show that Jevons' careless mathematical escapades lead of necessity to the destruction of the theory of value when they are relentlessly pursued to their ultimate logical conclusion. And one has to record that the modern versions of the theory of value which stem from this treacherous root simply blot out the modest, but perfectly clear, truth that is contained in the "law of decreasing marginal utility"; a truth which earlier writers had considered the pivot of the subjective theory of value.

III

The content of the fundamental relations (7) and (8) above can be summed up by saying that, in a given market situation, utility is maximised by pushing purchases to that limit where marginal utility, i.e. the utility of a marginal purchase, vanishes. Now a function qualifies as an index of utility when it reflects faithfully these essential properties of economic value judgments. After what has been said before, it is no longer difficult to see that $f = U(\alpha + x, \beta + y) - U(\alpha, \beta)$ satisfies all reasonable claims that can be made in this respect. Being a function in two sets of variables, it enables one to distinguish clearly between the quantity and the position vector: one just writes $q = (x, y)$, $p = (\alpha, \beta)$ and identifies

$$f(p, q) = U(p + q) - U(p) \quad \text{.......................(9)}$$

The relations (8) are now easily transcribed in terms of U. Bearing in mind that $p_o = p_a + q_o$, $p_{-2} = p_o - 2q_m$, etc., they read as follows

$$\ldots > U(p_{-1}) - U(p_{-2}) > U(p_o) - U(p_{-1}) > 0 > U(p_{+1}) - U(p_o) > \ldots$$

Now these are relations between *numbers*, and numbers we may manipulate according to the laws of Arithmetic. It can be inferred, e.g. that

$$\ldots < U(p_{-2}) < U(p_{-1}) < U(p_o) > U(p_{+1}) > \ldots$$

holds, and further, by subtracting $U(p_a)$, the following line may be obtained:

$$\ldots < U(p_a + q_o - 2q_m) - U(p_a) < U(p_a + q_o - q_m) - U(p_a) < U(p_a + q_o) - U(p_a) > U(p_a + q_o + q_m) - U(p_a) > \ldots .$$

But this last line is, by virtue of (9), equivalent to the maximum principle (7).

Evidently this is a very satisfactory result, for it shows that the utility index f brings into clear relief the logical relation between the two fundamental inequalities (7) and (8). We know that the stronger principle (8) implies (7), and as we have now been able to demonstrate this implication by means of a simple arithmetic manipulation of the auxiliary function U, we may conclude that such manipulations are legitimate. The reversal of this procedure leads to the same conclusion: starting from a transcription of (7) we cannot recover the principle (8); which is exactly as it should be, because we know that the law of decreasing marginal utility is richer in content than the mere maximum principle. Thus the function (9) accomplishes all that can be expected of an utility index, and everything is in good order so long as one avoids confusing utility with the auxiliary function U.

The methods by means of which the classical writers extracted from the index function the basic equations of economics lose all their mystery. At the price π the quantity vector is $q = (x, -\pi x)$, and if we wish to find e.g. the equation of the demand curve by means of the method "say when", we have merely to determine, for variable x, the maximum of

$$f(p_a, q) = U(a + x, \beta - \pi x) - U(a, \beta).$$

The maximum condition $df(p_a, q)/dx = 0$ is immediately seen to be equivalent to

$$\frac{\partial U}{\partial \xi} - \pi \cdot \frac{\partial U}{\partial \eta} = 0,$$

i.e. Marshall's equation of the demand curve.[1] Alternately we can proceed by the method of "second helping", and the reader will easily verify that

$$\underset{q_m \to 0}{\mathit{Limes}} \left[f(p_a + q - q_m, q_m) = 0 \right]$$

leads to precisely the same result.[2] The restriction to two variables is irrelevant; a little reflection will show that the vectors p and q may have any number of components. The whole corpus of classical economics may be thus deduced.

All this should not cause the slightest surprise. It was pointed out before that the classical writers really worked with the index f, and that the function U played only a secondary rôle in their thoughts. One might have guessed that much from Marshall's familiar discussion of the demand curve. There it is obvious that the magnitude which the consumer maximises is what Marshall describes as the "surplus". And indeed, the index $f(p, q)$ is nothing but the familiar *consumer's surplus*, the utility carried by the quantity vector $q = (x, -\pi x)$. It was most unfortunate, but it is in no way essential to Marshall's argument, that in the lore of the textbooks consumer's surplus became rigidly identified with the area underneath the demand curve. This happened because Marshall worked naively with Jevons' formulæ, assumed the "degree" of marginal utility of money to be constant, and for the rest relied on the intuitive clarity of his drawings on the blackboard. Questions of measure do not seem to have troubled him. But for later generations the mere suggestion of measurability was sufficient to bring consumer's surplus into disrepute. In fact, however,

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[1] Proof: By expansion one has $f = U(a + x, \beta + y) - U(a, \beta) = x(U_1 - \pi U_2) + (x^2/2!)(U_{11} - 2\pi U_{12} + \pi^2 U_{22}) + \ldots.$, where the differentials have to be taken at $p_a = (a, \beta)$. Hence $df/dx = 0 = (U_1 + xU_{11} - \pi x U_{12} + \ldots.) - \pi(U_2 + xU_{21} - \pi x U_{22} + \ldots.) = \frac{\partial U}{\partial \xi} - \pi \frac{\partial U}{\partial \eta}$, where the last two differential coefficients refer to $p_a + q_0$.

[2] Proof: $f(p_a + q - q_m, q_m) = 0$ means in terms of U: $U(a + x, \beta - \pi x) - U(a + x + \epsilon, \beta - \pi x - \pi\epsilon) = 0$. Expand and divide by ϵ. In the equation thus obtained let ϵ go against zero. Again Marshall's law of demand emerges without difficulty.

Marshall's intuition was quite right. His pronouncements on the subject can be shown to be quite independent of his expository devices, and can be rigidly established. They certainly are not affected by arbitrary transformations of his utility index f. The problem of how to formulate the laws of economics in view of the immeasurability of utility thus turns out, after all, to be essentially a trivial matter.[1]

IV

While the function $U(\alpha + x, \beta + y) - U(\alpha, \beta)$ makes sense as a value judgment and can be used, therefore, as an index of utility, its component U has by itself no specific meaning and enters into the discourse only as a tool of description. This can be easily demonstrated. Imagine a quantity vector q of constant length being rotated about a position p_a as indicated in figure 2. We have good reason to believe: that the index of value $f(p_a, q)$ will assume on the periphery of the circle a (positive) maximum and a (negative) minimum value; and that it will be changing continuously while q sweeps from the maximum to the minimum location. Rolle's theorem ensures that there will be at least two points on the circle where the index has the value zero. Now imagine the circle gradually expanding. For reasons of continuity there must be a curve for which $f(p_a, q) = 0$.

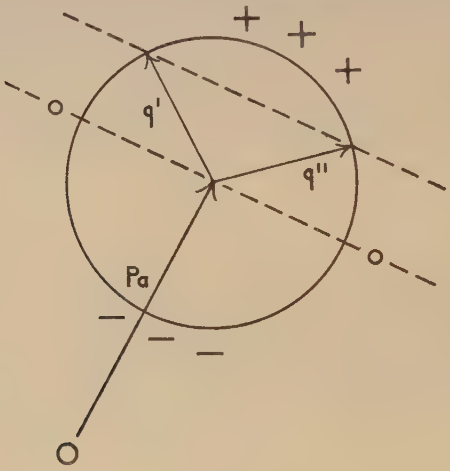

FIG. 2.

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[1] Parturient montes; nascetur ridiculus mus.—Horace: *De Arte Poetica*, 139.

It is the borderline separating all vectors q which—in the position p_a—are valued positively, from those that are rejected. We call it the indifference curve of index zero. The position p_a itself will be a point on it, as $f(p_a, 0) = 0$. Similarly one can note on the circle in general at least two vectors q' and q'' for which $f(p_a, q') = f(p_a, q'')$ holds. By allotting to this specific f an arbitrary numerical value c, and repeating the previous performance, one finds the indifference curve with the index c. Letting c run over the continuum, one obtains thus a mapping of the commodity space by means of the one-parametric function $c = f(p_a, q)$.

Now one would expect this function to display the characteristic features of value judgments, namely:

i. that a unit of a commodity X appears less and less desirable, the larger the amount α of X which the person has already in possession:

$$\frac{\partial f[(\alpha, \beta); (1, 0)]}{\partial \alpha} < 0;$$

ii. that, up to a certain limit of satiation, larger amounts of X are more welcome than smaller amounts:

$\frac{\partial f\ [(\alpha, \beta);\ (x, 0)]}{\partial x} > 0$ for all x below the limit of satiation;

and similar conditions applying to the other variables. In other words, one would expect the function f to fulfil the inequalities (2) – (4) and (6) above. We have used earlier

$$f(p_a, q) = 2x(-a\alpha + h\beta + g) + 2y(-b\beta + h\alpha + k) - (ax^2 - 2hxy + by^2)$$

as an example, because it embodies these assumptions in a convenient form.

It is now *wholly accidental*, and in no way relevant for economics, that the index f has been built up from the quadratic form (1) simply by putting

$$f(p_a, q) = U(\alpha + x, \beta + y) - U(\alpha, \beta).$$

The use of U is merely an analytical device and need not be mentioned at all. However, if it is mentioned, then one must beware of confusing f and U. In fact, the two could only be identified by letting $p_a = 0$, and using the formula $f(0, q) = U(x, y) = U(q)$. Only in this way can the function U be mistaken for a value judgment, but we have already commented upon the extravagance and irrelevance of the formula $f(0, q)$: in no market is the value of goods ever judged from the angle of the naked void.

If one blunders and mistakes $U(q)$ for an index of utility, the penalty is immediate. While the fundamental relations (7) can still be expressed satisfactorily:

$$U(p_a + q_o - 2q_m) < U(p_a + q_o - q_m) < U(p_a + q_o) > U(p_a + q_o + q_m),$$

the rendering of (8) becomes impossible for lack of a variable position vector. And thus the trouble of the modern versions of the theory of value begins.

Jevons and Edgeworth were quite aware that marginal utility requires a position vector. Very sensibly they got over this difficulty by writing $U(\alpha + dx, \beta + dy) - U(\alpha, \beta) = dU = (dU/dx) . dx + (dU/dy) . dy$, where $(dx, dy) = q_m$ is a marginal increment. This is, of course, perfectly legitimate, *only one must not interpret U as utility*. If one does so interpret it, one is at once punished by having to solve the appalling conundrum as to how an extensive magnitude such as dx can be multiplied into the " degree of marginal utility dU/dx " and how such an ill-begotten mongrel can then be *added* to another of that ilk : $(dU/dy) . dy$. It will be remembered that this puzzle drove Jevons into profound speculation which was as mystic as it was absurd. His utilitarian convictions prevented him from realising what he was doing. Moreover this spurious utility has then to be measurable, for *sums* can only be expected to transform in the same manner as their summands when the choice of the transformation is restricted to multiplication by an arbitrary constant: $F(u + v) = F(u) + F(v)$ holds only when $F(w) = cw$.

Jevons and Edgeworth, fortunately, merely *said* that U was utility, but in fact they worked with a genuine value index of the form $f(p, q)$. The blunder thus remained a comparatively harmless slip of the tongue which did not seriously prejudice their results. We seem to remember, however, that their heirs set out to excise with Occam's razor the last vestiges of Utilitarianism from the corpus of economic theory. Thus it became a serious matter that these very earnest purists of scientific method copied, swallowed and retained the very essence of Jevonsian mysticism. It can only be ascribed to poor mathematical workmanship.

The fashionable philosophy of Behaviourism gave, of course, no help when the reformers eagerly adopted the jargon " of mere preference scales". The scandal remained that a person on being shown three possible positions p_a, p_b, and p_c, say, would perfectly truthfully explain:

"I like p_b better than p_c, but from p_c I would really *much rather* go to p_a than to p_b"—

but that in the new theory he was forbidden to say so. In vain would the unfortunate try to explain—and in fact unmistakeably indicate by his *behaviour*—that he did not merely mean $U(p_a) > U(p_b) > U(p_c)$, but rather $U(p_a) - U(p_c) > U(p_b) - U(p_c) > 0$. Being firmly wedded to the dogmatic faith that such differences meant the sin of introducing a cardinal measure of utility, the new Science refused him a hearing.

It can confidently be predicted: so long as economists do not learn to distinguish between utility and an auxiliary function, such differences will remain in their eyes an unpardonable sin for ever and ever after.

V

It is indispensable that all those who are busily weaving the new garments of economic theory should lay aside the fascinating novel tools of their creation, and pause to reflect as to what they are really doing. In fact, all writers who have been forcing the problems of economics into the straight-jacket of preference scales and of marginal rates of substitution, and in particular those authors who lately seem to receive such scales by revelation, are herewith solemnly and legitimately suspended from their labour, until they shall have answered satisfactorily the question: why should anybody be constrained to observe the fancy rule (for which there appears to be no authority whatever) that only properties of the *slopes* of indifference curves should be used in the formulation of the laws of economics? In other words, why should economists take the slightest notice of invariants to monotonic transformations of functions which quite accidentally, as subordinate tools of description, are being used, customarily, for mapping out the commodity space? In the past we have heard much of mathematical necessities which, it was said, compelled economic theory to conform with such an exotic ritual. It is sincerely to be hoped that we shall hear no more of this, once the substance of the present article has sunk in.

Science has not only to create, but also to preserve, and the surest guarantee of progress lies in a clearly discernible line of continuity of thought. There must be no arbitrary and artificial revolutions. The truth of science would be hopelessly surrendered to the whims of fashion, if changes could be introduced without rhyme or reason. The public has a right to know why in the last twenty years the language of economics has been changed beyond recognition, why illuminating truths which were once the pivots of the textbooks have been abandoned, why no more is heard of marginal utility which the creators of the subjective theory of value considered as their great revelation, why simple complementarity of goods like bread and butter requires nowadays excursions into third dimensions, why indeed the whole theory of value has been transmogrified into a tangle of mathematical abstractions which day by day seem to increase in baroque exuberance, and which are rapidly becoming the nightmare of the classroom.

Should the required explanation not be forthcoming, the public has the right to revert without further ado to those simple, clear and valid formulations of the theory of value which are to be found e.g. in that classic treatise bearing —not undeservedly—the title: *The Common Sense of Political Economy.*

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The Acceleration Principle and the Theory of Investment: A Survey[1]

By A. D. Knox

I

Over the past two decades the acceleration principle has played an extremely important part in the theory of investment. Its history, however, takes us back to the early years of this century[2]; and a considerable literature exists on the uses to which it may be put and on the reliability of its explanation of the motives for investment in capital equipment.[3]

The main body of literature centres on the acceleration principle and the trade cycle. Here the popularity of the principle dates from the development of the multiplier and the realisation that neat models could be based on the interaction of these two theories. J. M. Clark drew attention to the possibilities of such models,[4] but they were first fully developed by Lundberg[5] and Harrod.[6] Harrod's work, in particular, aroused considerable interest in the acceleration principle—or the relation, as he called it—for in it the principle was brought to the very forefront of the analysis of the cycle. "It is a relation," wrote Mr. Harrod, "which has, indeed, been noted by learned writers often enough. Nonetheless I have the impression that not nearly sufficient importance has, on the whole, been attached to it. Its simplicity, ineluctability, and independence of all special theories as to the workings of the cyclical process demand for it pride of place."[1] Since 1936 the acceleration principle has been significant in a number of models of the cycle: the rigorous statement of the interaction of the multiplier and the acceleration principle presented by Samuelson,[2] and the later refinements of Bennion,[3] Baumol,[4] Hicks,[5] and Goodwin.[6]

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[1] I should like to express my thanks for helpful suggestions to Mr. A. W. Phillips, Professor Lionel Robbins, Dr. W. J. L. Ryan, and Mr. Ralph Turvey.

[2] The main early works on the acceleration principle are: A. Aftalion, "La réalité des surproductions générales," *Revue d'Economie Politique*, 1909, pp. 219–220, and *Les Crises Périodiques de Surproduction* (Paris, 1913), tôme II, pp. 356–370; C. F. Bickerdike, "A non-monetary cause of fluctuations in employment," *Economic Journal*, 1914; and J. M. Clark, "Business acceleration and the law of demand: a technical factor in economic cycles," *Journal of Political Economy*, 1917, and reprinted in American Economic Association, *Readings in Business Cycle Theory* (Philadelphia, 1944), pp. 235-260.

[3] Useful bibliographies are in: G. von Haberler, *Prosperity and Depression* (Geneva, 1941), p. 87; and *Readings*, *op. cit.*, pp. 460–462.

[4] J. M. Clark, "Additional note on 'Business acceleration and the law of demand'," in *Preface to Social Economics* (New York, 1936) and reprinted in *Readings*, *op. cit.*, pp. 259–260; and *Strategic Factors in Business Cycles* (New York, 1934), pp. 167–183. See also R. Frisch, "Propagation problems and impulse problems in dynamic economics," in *Essays in Honour of Gustav Cassel* (London, 1933).

[5] E. Lundberg, *Studies in the Theory of Economic Expansion* (London, 1937), ch. 9.

[6] R. F. Harrod, *The Trade Cycle: an Essay* (Oxford, 1936), especially ch. 2.

The acceleration principle, as applied to the theory of investment in capital equipment, has been used in two other connexions. In part the theory of pump-priming rests upon it.[7] More recently the major use of the principle has been with regard to the problem of the long-run growth of an economy. As in the theory of the trade cycle, it has lent itself to the formulation of neat models.[8]

Finally the acceleration principle has also been used to explain investment in stocks[9] and in durable consumers' goods.[10] These applications are not discussed in this survey.

When applied to the explanation of investment in fixed capital, the acceleration principle is said to tell us what will be the behaviour of that part of this investment which is net and induced. These two terms have never been clearly defined in the literature on the acceleration principle; and indeed they do not lend themselves to precise definition. In rough terms, therefore, by net investment is meant an expansion of productive capacity.[1] Induced investment is the portion of net that depends on current movements in output; and thus the acceleration principle relates to investment in existing firms that produce existing types of goods for existing markets.[2] The acceleration principle as applied to net induced investment in a *single firm* may be stated rigorously and *without qualification* by means of a simple equation:

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[1] *Op. cit.*, pp. 53–54.

[2] P. A. Samuelson, "A synthesis of the principle of acceleration and the multiplier," *Journal of Political Economy*, 1939; and "Interactions between the multiplier analysis and the principle of acceleration," *Review of Economic Statistics*, 1939. The latter article has been reprinted in *Readings*, *op. cit.*, pp. 261-269.

[3] E. G. Bennion, "The multiplier, the acceleration principle, and fluctuating autonomous investment," *Review of Economic Statistics*, 1945.

[4] W. J. Baumol, "Notes on some dynamic models," *Economic Journal*, 1948.

[5] J. R. Hicks, "Mr. Harrod's dynamic theory", *Economica*, 1949; and *A Contribution to the Theory of the Trade Cycle* (Oxford, 1950).

[6] R. M. Goodwin, "Secular and cyclical aspects of the multiplier and the accelerator," in *Income, Employment and Public Policy: Essays in Honor of Alvin H. Hansen* (New York, 1948); and "The non-linear accelerator and the persistence of business cycles," *Econometrica*, 1951.

[7] E.g., J. M. Clark, *Economics of Planning Public Works* (Washington, 1935); International Labour Office, *Public Investment and Full Employment* (Montreal, 1946); and H. M. Somers, *Public Finance and National Income* (Philadelphia, 1949), ch. 5.

[8] Lundberg, *op. cit.*, p. 180; R. F. Harrod, "An essay in dynamic theory," *Economic Journal*, 1939, and *Towards a Dynamic Economics* (London, 1948), especially ch. 3; E. D. Domar, "Capital expansion, rate of growth and employment," *Econometrica*, 1946, and other articles; Baumol, *op. cit.*; Hicks, *opera cit.*; and S. S. Alexander, "The accelerator as a generator of steady growth," *Quarterly Journal of Economics*, 1949, and "Mr. Harrod's dynamic model," *Economic Journal*, 1950.

[9] M. Abramovitz, *Inventories and Business Cycles* (New York, 1950), pp. 19–26, and the literature mentioned there; and J. Tinbergen, "An acceleration principle for commodity stockholding and a short cycle resulting from it," in O. Lange *et al.* (eds.), *Studies in Mathematical Economics and Econometrics* (Chicago, 1942).

[10] There is a fairly extensive literature, but the main elements of the theory are outlined in Haberler, *op. cit.*, pp. 92–99.

$$C_t \equiv K_t - K_{t-1} = \alpha\,(O_t - O_{t-1})$$

Output of capital goods	Increase in stock of capital goods	Increase in final output times the accelerator.

The symbols have the following meanings:

C Current output of capital equipment employed by the firm to make a net increase in its capital stock. In what follows this is referred to simply as output.

K The firm's stock of capital equipment.

O The firm's output of finished products—referred to as final output.

α The accelerator or the coefficient of acceleration. This is the ratio between the current increase in the stock of capital equipment and the current increase in the flow of final output produced with that equipment. The accelerator is assumed to be constant.

t, $t-1$, etc. Time periods.

It is useful to express the acceleration principle in this form, for its two parts may readily be seen. The first part—$C_t \equiv K_t - K_{t-1}$—is an identity which tells us the very obvious fact that the current output of capital equipment for net investment is equal to the current increase in the stock of equipment. The second part is a theory of investment. Because the accelerator is assumed to be constant, there is always a fixed connexion between the current growth of capital stock and the current rise in final output. The validity of the theory of investment depends upon whether we can really assume the accelerator to be constant.

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[1] There is a discussion in part II of this paper on the possibility of distinguishing between net and replacement investment. But since the acceleration principle rests on the assumption that this distinction may be made, the validity of doing so is not questioned for the moment.

[2] The distinction is between induced investment on the one hand and spontaneous or autonomous investment on the other hand. Once expectations are introduced it becomes increasingly difficult to maintain the distinction. But as will be pointed out at the beginning of part II, we cling to the distinction in order to restrict the scope of this paper.

Despite its tautological nature, the first part yields certain useful and important conclusions about the timing and the proportional amplitude of fluctuations in the stock of capital equipment and in the output of the capital goods industries. The identity $C_t \equiv K_t - K_{t-1}$ expresses the fact that because capital equipment is durable[1] the stock of it exceeds the current output.[2] This excess of stock over output has the effect that turning points appear in output before they appear in stock, despite the fact that attempts to change the latter cause movements of the former. The condition that must be satisfied if C_t is to fall just below C_{t-1} is that $(K_t - K_{t-1})$ is less than $(K_{t-1} - K_{t-2})$, but that K_t exceeds K_{t-1}. In other words, the stock of equipment is rising, but not at a sufficiently fast rate to prevent a decline in the output of the capital goods industries.

The excess of stock over output has a further effect in that a given percentage fluctuation in stock means a more than proportionate fluctuation in output; and the more durable the stock the greater is the relative violence of the movements in output. This relationship may be shown by means of a simple arithmetical example. Assume that in period 1 one hundred machines of a particular type exist[3] and that the rate of replacement of these machines is a function solely of age. If they have a lifetime of 10 years then 10 machines are produced each year, so long as the stock of machines remains constant. Now assume a rise in that stock to 110 in period 2, at which level it remains in period 3. Output rises from 10 to 20, and then falls again to 10. A 10 per cent. increase in stock has led to a 100 per cent. rise in output, which then returns to its former level.[4] If, on the other hand, the lifetime of these machines is only 2 years, the same 10 per cent. increase in stock causes in period 2 only a 20 per cent. rise in output, which in period 3 returns to its former level of 50.

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[1] Durability can be adequately defined only with reference to some time period. If we take a sufficiently short period the stock of most goods is greater than the current output. Unfortunately the relevant period for the acceleration period is not clear and is likely to be variable. We must, therefore, fall back on common usage which defines durable goods as those which are not destroyed or transformed in the act of consumption or production.

[2] Were capital equipment not durable, then C_t would be equal to K_t: i.e., $K_{t-1} = 0$.

[3] Ten machines have been added to the stock in each of the past ten years.

[4] The increase in stock causes a rise in replacement investment only after a lag.

The effects of this purely technical relationship in matters of timing and amplitude are very useful in the analysis of business cycles; and its validity is unquestionable. This paper, therefore, is concerned with the second part of the acceleration principle: the theory of investment. So long as the accelerator is constant, the conclusions about the relationship between K and C apply also, once due allowances have been made for lags, to the timing and amplitude of fluctuations in K and in O. The crucial problem of the acceleration principle is whether the accelerator is constant.

The equation $K_t - K_{t-1} = \alpha(O_t - O_{t-1})$ states the acceleration principle in its most uncompromising form: net induced investment is solely a function of the rate of growth of final output. Stating it in this way enables us to see the mechanism at work. But few writers use this unqualified acceleration principle; and some have rejected the principle outright. Moreover, there have been various attempts to test it statistically, and the results of most of these tests have been unfavourable.[1] The next section attempts three things: (*a*) to set out the contending arguments on the modifications that should be made in the simple acceleration principle; (*b*) to assess the relative merits of these arguments, or at least to circumscribe the area of dispute; and (*c*) to seek from this review of the arguments the reasons for the unfavourable results yielded by the statistical tests.[2]

Before passing on to the next section it is necessary to make clear certain assumptions that will be maintained in this paper. The exposition of the acceleration principle related the investment of the single firm to the rate of growth of its output. One assumption is maintained for most of this paper, until it is explicitly abandoned. It is that inventories are ignored, together with such things as the lengthening or shortening of order books. Investment therefore depends equally well on the rate of growth of sales or of output. The second assumption, which is kept throughout, provides for the application of the acceleration principle to the whole economy. Strictly, we should trace the effects of the rate of growth of, say, the output of shirts on the investment of the shirt-makers ; the effects of the rate of growth of demand for shirt-making machinery on investment in the firms producing that machinery ; and so on. It is doubtful whether we can successfully do so. Therefore, whenever the subsequent analysis deals with the economy as a whole, the assumption to be made is that aggregate net induced investment is related to the rate of growth of national income.[1]

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[1] T. Hultgren, *American Transportation in Prosperity and Depression* (New York, 1948), pp. 157ff.; S. Kuznets, "Relation between capital goods and finished products in the business cycle," in *Economic Essays in Honour of Wesley Clair Mitchell* (New York, 1935), pp. 248–267; J. Tinbergen, "Statistical evidence on the acceleration principle," *Economica*, 1938, and *Statistical Testing of Business Cycle Theories* (League of Nations, Geneva, 1938), vol. I, chs. 3 and 5, and vol. II, ch. 2; T. Wilson, *Fluctuations in Income and Employment* (London, 1948), pp. 114ff.

On the other hand, Clark's statistical test yielded quite favourable results for the acceleration principle: *op. cit.*, *Readings*, pp. 245–249. A. S. Manne has argued that a slightly modified version of the principle can be substantiated empirically: "Some notes on the acceleration principle," *Review of Economic Statistics*, 1945.

[2] Even with the advances in Econometrics the tools available for empirical testing are still somewhat crude. There is something to be said for occasional "theoretical verifications" of the results of the statistical tests!

II

Many writers have criticised the acceleration principle, but no general agreement has emerged from these discussions. The history of discussions on the acceleration principle accounts at least in part for this continuing diversity of opinion. While much has been written on its various potential weaknesses, there have been few controversies in which the contending arguments might be marshalled and set forth as a whole. Issues have been raised for the most part without reference to previous discussions. Further, most writers have restricted their attention to a narrow range of criticisms ; and sometimes to only one.

In order to simplify the problem of presenting this scattered and varied material, it is preferable to arrange it analytically rather than chronologically. Further, we may exclude from our terms of reference part of the literature on the acceleration principle. Criticisms of the acceleration principle may roughly be divided into two categories : those that dispute whether the principle gives a true representation of the forces determining induced investment ; and those that, by questioning the importance of induced investment, cast doubt upon some of the more ambitious claims made on behalf of the principle. To settle the issues raised by both types of criticism would require a discussion of the entire theory of investment. Prudence, therefore, suggests that we concentrate on the first group. The problems to be discussed relate to[1] :—

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[1] For discussions on this point see J. M. Clark, *op. cit.*, *Readings*, pp. 252–253 ; Baumol, *op. cit.*, p. 514 fn. ; Hicks, *Trade Cycle*, *op. cit.*, p. 38 ; R. M. Bissell, " The rate of interest," *American Economic Review*, supplement, 1938, p. 32. The fullest discussion of this problem is to be found in B. A. Chait, *Les Fluctuations Economiques et l'Interdépendance des Marchés* (Brussels, 1938).

(i) surplus capacity ;
(ii) replacement investment ; and
(iii) expectations about demand, and the related questions of prices and profits.

(i)

It is not easy to find the rationale for the acceleration principle. It is often called the acceleration principle of derived demand. The theory of derived demand as applied to investment tells us that a rise in the stock of capital equipment will continue only if there is at some stage an increase in consumption.[2] But this is not the same as saying, with the acceleration principle, that a given percentage rise in consumption must be met by an equal percentage rise in the stock of capital equipment. There appeared very soon the qualification that where surplus capacity exists the acceleration principle is not valid. In other words, the necessary assumption for the acceleration principle is that firms should be working at full capacity. J. M. Clark in his first article on the acceleration principle made this assumption quite clear when he wrote : " . . . the first increase in demand for finished products can be taken care of by utilising the excess producing capacity which an industry using much machinery habitually carries over a period of depression. Thus they do not need to buy more equipment the instant the demand begins to increase."[3] Many subsequent writers have noted that full capacity is a prerequisite for the acceleration principle but not one that is likely to be satisfied in the early stages of a cyclical upswing. That the accelerator is asymmetrical as between upswing and downswing has been argued by Tinbergen :

> " Very strong decreases in consumers' goods production must not occur. If the principle were right, they would lead to a corresponding disinvestment and this can only

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[1] For a complementary approach to the acceleration principle, see S. C. Tsiang, " Accelerator, theory of the firm, and the business cycle," *Quarterly Journal of Economics*, 1951.

[2] Cf. the lengthy discussion in M. Bouniatian, *Les Crises Economiques* (Paris, 1922), esp. pp. 234ff.

[3] *Op. cit.*, *Readings*, p. 244.

> take place to the extent of replacement. If annual replacement amounts to 10 per cent. of the stock of capital goods, then a larger decrease in this stock than 10 per cent. per annum is impossible. A decrease in consumers' goods production of 15 per cent. could not lead to a 15 per cent. decrease in physical capital as the acceleration principle would require. It is interesting that this limit is sharper the greater the duration of life of the capital goods considered."[1]

This criticism is generally accepted; and it is agreed that the acceleration principle can make but little contribution to the explanation of the lower turning point. Many writers, however, argue that surplus capacity is exhausted during the upswing.[2] On this view the principle is useful for the analysis of the downturn and of long-run growth.

The matter is allowed to rest there by most writers; but not by all. Tinbergen stresses that it is only when production has reached full capacity that " the necessity of the principle's action recurs; "[3] and he argues that statistical evidence shows that this condition is rarely, if ever, satisfied.[4] The arguments and assumptions that have been surveyed so far make this a challenging criticism. Two things, however, must be borne in mind:

(*a*) The terms " capacity " and " surplus capacity " (and its variants " excess " and " unused " capacity) are much bandied about in discussions of the acceleration principle, but they are not defined.

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[1] Tinbergen, *op. cit.*, *Economica*, 1938, p. 165.

[2] E.g., F. A. Burchardt, " The causes of unemployment," in Oxford Institute of Statistics, *The Economics of Full Employment* (Oxford, 1947), p. 29.
Haberler, *op. cit.*, p. 96.
A. H. Hansen, *Fiscal Policy and Business Cycles* (New York, 1941), p. 282.
Hicks, *Trade Cycle*, *op. cit.*, ch. IV.
W. Röpke, *Crises and Cycles* (London, 1936), p. 104.
Somers, *op. cit.*, p. 102.
Wilson, *op. cit.*, pp. 45–46.
Perhaps a word should be devoted to Manne's treatment of this capacity problem. He seeks to get round the difficulties experienced by the accelerator by relating changes in output to variations in the amount of equipment actually employed. The results of his correlations are much better than those obtained by correlating changes in output with changes in the stock of equipment. This is an interesting way of looking at the principle, but one that smacks a little of tautology. This is particularly so if we take this approach to its logical conclusion and include in the dependent variable not merely variations in the amount of equipment used, but also in the intensity with which it is used. Cf. Manne, *op. cit.*, pp. 94–96.

[3] *Op. cit.*, *Economica*, 1938, p. 166.

[4] *Ibid.*, p. 167, and " Critical remarks on some business cycle theories," *Econometrica*, 1942, p. 139. See also R. G. Hawtrey, review of Bouniatian, *Les Crises Economiques* (ed. 2), *Economic Journal*, 1932, p. 437: " The productive power of the community is *never* fully employed even at times of intense activity. It would seem to follow that the appearance of an increased demand for consumption goods does not in itself require additional capital equipment, but merely the fuller employment of that which already exists." (Hawtrey's italics.)

(*b*) It is true to say that full capacity is commonly taken as a prerequisite for the acceleration principle, and that this full capacity is apparently looked upon as some *ne plus ultra* beyond which output cannot be expanded without the addition of capital equipment. There are, however, some writers who have queried whether this assumption is consistent with some of the conclusions derived from the acceleration principle; and others who query whether it is a necessary assumption.

In its simplest form the acceleration principle postulates that an increase in the rate of growth of output is accompanied simultaneously by a rise in net investment. In its more complex forms there are many variants of the lags involved, but they all agree that the rise in investment does not come first.[1] This is not possible when the economy is working at full capacity. Output cannot rise until additional capital equipment has been produced and installed; and in an economy where the process of production has become very roundabout this gestation period is long. Moreover, the problem is not restricted to one of lags. A long gestation period may cause variations in the accelerator; but this problem is left until II (iii).[2]

The second doubt raised in (*b*) is whether full capacity is a necessary assumption for the acceleration principle. Tinbergen thinks so; Clark does not. He suggests that there is always some surplus capacity in the economy and that it is fully compatible with the acceleration principle.[3] Are we to interpret this as a real conflict of view or merely as a difference of definition? It is not possible to say, because no definitions are given. It will be useful therefore to outline the possible definitions of capacity and to inquire into their implications for the acceleration principle.

At least four principal definitions of capacity appear in various economic writings:

(*a*) In terms of the single firm, the point at which its average total cost curve becomes vertical. This definition is hardly realistic, for it implies that "all of the strategic factor (plant and machinery) is operated at maximum speed and none is strictly idle for any of the 168 hours in a week."[1]

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[1] For a summary, cf. Somers, *op. cit.*, pp. 77–80.

[2] Cf. p. 293.

[3] "Additional note . . .", *Readings*, *op. cit.*, pp. 256–257. This is a later work than that quoted on p. 275.

(*b*) "Practicable" capacity: i.e., the output that a firm can maintain for a reasonable period with a given plant, making due allowance for such factors as seasonal fluctuations, repairs, obsolescence, and custom and regulations governing hours of work.[2] Capacity here is less than under (*a*). The definition is more realistic, but precision is lost.

(*c*) The output at a firm's minimum average total cost. "At that point the differential cost of added output will be equal to the average cost, including all overhead costs on account of the machine itself. Beyond that point it will pay to get more machines. This point might furnish a theoretical measure of capacity, but one that would be hard to apply."[3]

(*d*) Where marginal cost equals marginal revenue. This is a useful supplement to the other definitions when imperfect competition is under discussion; but for present purposes it has serious drawbacks. So far as firms seek to maximise profits they will usually be operating at capacity in this sense; and an increased demand may lead to a rise in the stock of capital or—equally well if we are discussing the economy—in price. The definition can have little meaning for the acceleration principle and may be ignored.

So much for the definitions—what are their implications for the acceleration principle? When the firms of an economy are working at full capacity in the sense of definition (*a*) the common view is apparently that the acceleration principle is inexorably valid. As pointed out on page 277 this neglects some problems, which are being left until II (iii). At the moment the point at issue is the doubt whether this capacity is often attained. Breakdowns may occur; single shift working may be customary; or the organisations of firms may not be as efficient as possible; and so on. For these same reasons, however, the presence of surplus capacity in the sense (*a*) does not necessarily invalidate the acceleration principle. There is in fact some *prima facie* reason for using definition (*b*); but this may be rejected in favour of (*c*).

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[1] R. Noyes, "Certain problems in the empirical study of costs," *American Economic Review*, 1941, p. 482.

[2] The attempt was made to "limit our estimates to what would be practically attainable under conditions of 'sustained simultaneous operations'." E.G. Nourse *et al.*, *America's Capacity to Produce* (Washington, 1934), p. 23.

[3] J. M. Clark, *Studies in the Economics of Overhead Costs* (Chicago, 1923), p. 91. This definition may give the same result as (*a*) if the average total cost curve has the particular shape attributed to it by some writers: i.e., falling to the point of least cost and then rising vertically. The validity of this hypothesis is questionable and it need not detain us here. Cf. W. J. Eiteman, "Factors determining the location of the least cost point," *American Economic Review*, 1947, and "The least cost point, capacity, and marginal analysis," *ibid.*, 1948; and W. H. Haines, "Capacity production and the least cost point," *ibid.*, 1948.

The acceleration principle may be given a simple rational basis. It may be interpreted to mean that entrepreneurs will meet a rise in demand by expanding their plant, where the cost of producing the extra output with the existing plant exceeds the operating cost with the enlarged plant plus the costs of purchasing and installing it. If we assume with the acceleration principle that changes in output are the only forces making for investment, we may conclude that there is no incentive for investment before the least cost point is reached,[1] and an increasing incentive the further beyond that point output goes.[2] Definition (*c*) is the most useful.

This interpretation enables us to reach some tentative conclusions about capacity and the acceleration principle. It is possible to admit the existence of surplus capacity as defined by (*a*) or (*b*) and to argue that the acceleration principle is a useful theory. Some such difference on the rationale of the principle may lie at the basis of the divergent views held by Clark and Tinbergen. Even if this is the explanation of the conflict of conclusion, Tinbergen's stress on the volitional nature of investment is justified. There is nothing inevitable about investment, as the simpler version of the acceleration principle would have us believe. Tinbergen, however, presses rather too far the conclusion he derives from the capacity argument.[3] The aspect of the acceleration principle that is challenged by the vagueness of full capacity is its usefulness in explaining the timing of investment. From the moment at which least cost output is passed there is a possibility of investment; but there is no knowing just when the decision to invest will be taken. On the other hand this conclusion does not question the aspect of the acceleration principle that apparently gives it its major appeal.

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[1] Cf. C. D. Long, *Building Cycles and the Theory of Investment* (Princeton, 1940), pp. 59–60.

[2] It should be remembered that the acceleration principle deals with the investment of existing firms. Cf. p. 271.

[3] *Op. cit., Economica* 1938, esp. p. 167.

It is only reasonable to expect that when an entrepreneur invests, the amount of his investment is governed in some measure by a comparison of the output he can most efficiently produce with his existing plant and the output at which demand conditions now justify him in aiming. The timing and the volume of investment are not fully independent. But they are sufficiently so to justify this conclusion: provided that output does not fall below the least-cost points of the firms in an economy, we may query the validity of the acceleration principle in explaining the timing of investment but not the volume.

The inadequacy of the acceleration principle in matters of timing is emphasised by other considerations. If net investment is to be strictly a function of the rate of growth of output, then the units into which the stock of capital equipment is divisible must be the same as those into which output is divisible. This point has been developed by Kuznets. On the assumption of perfect foresight, and of a certain period within which plant cannot be varied, he shows that where demand alters during this period the entrepreneur maximises his profits by having a plant of such size that part of it stands idle for some of the time.[1] His analysis suffers, however, in that he does not clearly show what determines this period within which plant is not varied. There are three principal reasons:

(*a*) The technical factor. Capital equipment may be bulky, and the employment of additional plant is justified only when output has risen considerably.[2] This factor is all the more important because usually what is added is a complex of machines and not a machine.

(*b*) The extension of plant may interfere with current output directly and will almost certainly do so indirectly through a diversion of managerial energies.[3] There are thus likely to be lulls in investment.

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[1] *Op. cit.*, pp. 231–236.

[2] Long, *op. cit.*, pp. 61–2: "For example, paper making machines for the manufacture of newsprint paper come only in million dollar units capable of producing one-fourth the requirements of a good-sized plant and characterised by great durability."

[3] Hultgren, *op. cit.*, p. 167, who writes that as a result of such factors "no one railroad typically buys cars in continuous driblets; or at any rate small repetitive purchases can hardly account for any large part of total orders." Cf. also W. W. Heller, "The anatomy of investment decisions," *Harvard Business Review*, March 1951, p. 102: "One of the unforeseen—and most interesting—investment barriers was the bottleneck in top engineering and management talent."

(*c*) The addition of plant may enhance the entrepreneur's uncertainty. He is now faced with the development of new markets to absorb his expanded output.[1] This factor, however, is possibly unimportant when discussing purely induced investment.

There can be little doubt that investment in the single firm is essentially a discontinuous process. Whether similar lulls will occur in the investment activity of the entire economy is not readily apparent. The process of aggregation may smooth them over; but it is difficult to believe that the timing of investment will be that suggested by the acceleration principle.

The literature on capacity and the acceleration principle is rambling, and in setting out and weighing the various arguments we have rambled with it. Our conclusions may nevertheless be stated briefly. It is not possible to devise a definition of capacity that is both realistic and precise. The acceleration principle, therefore, is not precise; but it draws attention to a possible reason for investment so long as firms are operating along the rising segment of their average total-cost curves. The effects of this lack of precision may be summed up by saying that the acceleration principle is unsatisfactory as an explanation of the timing of investment. It suffers from a further weakness: it is not of much use for explaining the lower turning point. But a rider must be added to this earlier criticism: it is valid only where output in all firms has fallen below their least-cost points.

(ii)

In his first outline of the acceleration principle[2] Clark assumes that net investment is a function of the rate of growth of output, but that replacement depends on its level. The implications of this thesis about replacement have interested many writers; but largely the assumption itself has been accepted. Pigou notes that as net investment falls replacement may rise and offset the depressing effects of this fall.[3] Frisch attaches even more importance to this qualification. He shows that the extent to which replacement may offset net investment depends on (i) the speed with which the rate of growth of output is falling, and (ii) the sizes of the two categories of investment. It is in fact quite conceivable that total capital production may approach some constant level.[1] Since Frisch's statement of the problem, the argument has waxed and waned. Hansen censors Harrod for his neglect of the movements of replacement.[2] Clark[3] and Somers[4] recognise the strict validity of Frisch's criticism, but doubt whether circumstances often arise to make it really important. Samuelson defends the neglect of replacement with an argument[5] that is ingenious but also somewhat spurious in that it equates replacement with depreciation.

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[1] Cf. G. L. S. Shackle, *Expectations, Investment, and Income* (London, 1938), pp. 99–100.
[2] "Business acceleration . . . ," *op. cit.*, *Readings*, p. 238.
[3] A. C. Pigou, *Industrial Fluctuations* (London, 1929, ed. 2), p. 110.

No single conclusion emerges from this discussion. This uncertainty about the effects of replacement on the acceleration principle is heightened by the fact that it is not universally accepted that replacement is a function solely of the level of output. Haberler, for example, assumes that it depends on the age of equipment, and that therefore replacement cycles will reflect earlier fluctuations in investment.[6] Kuznets works out the various possible models in some detail.[7] Whether replacement cycles coincide with those in net investment depends on (i) the life of capital equipment, all of which is assumed to last for a constant period, amd (ii) the behaviour of gross investment in the relevant past period that is indicated by (i). The importance of the resulting replacement cycles in determining the turning points of gross investment depends on the relative volume of replacement and of net investment : that is, on the past behaviour of gross investment and on the present rate of growth of output.

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[1] R. Frisch, "The interrelation between capital production and consumer-taking," *Journal of Political Economy*, 1931, pp. 649–652, and subsequent articles in *ibid.*, April and October 1932. This criticism of replacement is the issue usually associated with these articles ; but, emphasised though it was by Frisch, it was not his principal worry. He was mainly concerned to make quite clear that the acceleration principle did not provide a closed model of the cycle. Cf. also his "Propagation problems . . . . ," *op. cit.*

[2] A. H. Hansen, *Full Recovery or Stagnation?* (London, 1938), p. 49.

[3] J. M. Clark, "Capital production and consumer-taking—a reply," *Journal of Political Economy*, 1931, and a later article in *ibid.*, October 1932.

[4] Somers, *op. cit.*, pp. 75–76.

[5] ". . . It would involve double-counting to include in the computation of the national income both consumption and the replacement expenditures imputable as costs of that consumption. Only net investment is "multiplied" to give the national income ; as a first approximation Harrod was justified in neglecting replacement in the formal relation." *Op. cit.*, *Journal of Political Economy*, 1939, p. 796. Long, *op. cit.*, pp. 78–82, presents the same argument at greater length.

[6] Haberler, *op. cit.*, p. 91.

[7] Kuznets, *op. cit.*, pp. 221–225. Kuznets reserves the Frisch-Clark assumption for such types of investments as traders' stocks. Cf. *ibid.*, pp. 217–218 and his comment on Frisch's analysis of replacement, p. 219 fn.

The age hypothesis has in its turn been qualified in a number of ways in the literature on the acceleration principle :

(*a*) Somers points out that replacement depends partly on the " extent to which capital goods are used to produce 'finished' products (in so far as depreciation is a function of use, i.e. through wear and tear or direct use in the process of production)."[1]

(*b*) Kuznets qualifies his assumption about the importance of the age of machines, and shows that, given a constant rate of obsolescence, it will pay to replace earlier at a higher level of output than at a lower.[2] He errs, however, in concluding that this substantiates Frisch's conclusions.[3] Durability and hence age have to be given some place in the theory, as Kuznets recognises when he writes that the level of output will influence the replacement of only those items of equipment as are " sufficiently near the end of their average period of life to be affected by the change in the prospective savings from the installation of new units . . . ."[4]

(*c*) Finally, Hicks has adduced two factors on which many elaborate echo effects have been based[5] : (i) capital goods do not have the same life-span, and (ii) they do not even have precise life-spans. From these two qualifications of the age hypothesis he concludes that replacement cycles will after a time become so damped that they may be ignored.[6]

In sum, a survey of the literature on replacement and the acceleration principle yields a bewildering number of conclusions. As with other aspects of the theory of investment, this variety of results reflects the complexity of the subject and our lack of empirical knowledge. The most that we can hope for, therefore, is to narrow somewhat the area of doubt. In particular we may be able to resolve the question whether replacement does or does not falsify conclusions drawn from the acceleration principle, although we may not be able to state the precise extent of this falsification.

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[1] Somers, *op. cit.*, p. 74. It should be noted that, contrary to what Somers implies, this yields the same result as the Frisch-Clark hypothesis only by ignoring the age of equipment.

[2] Kuznets, op. cit., pp. 238–243.

[3] *Ibid.*, p. 243.

[4] *Ibid.*, p. 241.

[5] The outstanding discussion of these echo effects is probably R. Frisch, " Sammenhengen mellem primaerinvestering og reinvestering " *Statsøkonomisk Tidsskrift*, 1927, pp. 117-152. Cf. also J. Tinbergen, " Annual survey : suggestions on quantitative business cycle theory," *Econometrica*, 1935, pp. 288–291.

[6] Hicks, *Trade Cycle*, *op. cit.*, pp. 41–42.

We must consider whether it is possible to distinguish clearly between net and replacement investment. What is relevant in determining whether a particular act of investment has added to or merely maintained the stock of capital is "whether a person maintains a stock of non-permanent resources which will secure him an increasing, constant, or decreasing income stream, not whether the stock itself increases, remains constant, or decreases in any of its directly measurable dimensions".[1] This being so we can assess the effects of investment only where it is possible to foresee with certainty the future income stream to be yielded by the new equipment. In the uncertain world of reality this cannot be done. Replacement and net investment cannot be clearly distinguished from one another. This conclusion may be supported by a second argument. By and large, firms when replacing machines install something larger or better.[2] The new equipment is both net investment and replacement. Even if it were possible to determine *ex post* what part of investment is net and what part replacement, the distinction would be artificial. At the same time, we must recognise that the distinction has not been adhered to by so many writers without good reason. It is useful in analysing the motives for investment. There are some motives that are peculiarly concerned with replacing equipment, and others with adding to it.[3] In discussing the rationale of gross investment it is necessary to consider both sets of forces and then the results of their interplay.

The acceleration principle errs in discussing net investment where it should discuss gross. For all that it can be condemned for concentrating on net only when it is shown that the result is a distorted theory of net investment. The problem of distinguishing between net and replacement is *prima facie* evidence that such a distortion exists. To test the adequacy of this conclusion we must now examine the nature of the factors that make for replacement. Is there such flexibility in the timing of replacement investment that entrepreneurs undertake it only when it is convenient to add to their plant? Or do they add to their plant when the time is suitable for replacement?

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[1] F. A. Hayek, *The Pure Theory of Capital* (London, 1941), pp. 300–1.

[2] Cf. R. P. Mack, *The Flow of Business Funds and Consumer Purchasing Power* (New York, 1941), pp. 251–52; and Heller, *op. cit.*, p. 100: "Replacement is seldom made without improvement. A worn-out piece of equipment is rarely replaced with an identical item".

[3] Cf. J. Tinbergen and J. J. Polak, *The Dynamics of Business Cycles* (London, 1950), p. 176; and M. Gort, "The Planning of investment: a study of capital budgeting in the electric-power industry, I," *Journal of Business of the University of Chicago*, 1951, p. 85.

Assuming that firms seek to maximise profits, there is an incentive to replace when the present value of the anticipated stream of profits from the new machines minus that from the old is greater than the price of the new machine minus the "scrap" value of the old.[1] This may be written:

$$\pi_{1t} - \pi_{2t} > P_{1t} - S_{2t} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

The subscript 1 refers to the new machines, while 2 refers to the old. The subscript t refers to the time period. π stands for aggregate profit. P is a composite of the purchase price of the new machines and of the total costs of installation. Lastly, S represents "scrap" value, where that is interpreted to mean (i) the price equipment can fetch on the second-hand market or as junk, and (ii) the alternative uses to which the firm may put it, either by holding it in reserve or by using it for some task requiring less precision.

Equation (1) may be rewritten in terms of operating costs:

$$\sum_{t}^{t+n} \frac{\Upsilon}{(1+i)^n}(c_2 - c_1) > P_{1t} - S_{2t} \ldots\ldots\ldots\ldots (2)$$[2]

Υ is the anticipated stream of output over future periods up to period $t+n$. c_1 is the average cost of production with

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[1] This discussion of the motives for replacing equipment is based on:

J. Einarsen, *Reinvestment Cycles and their Manifestation in the Norwegian Shipping Industry* (Oslo, 1938), which contains a useful survey of the earlier literature; and his "Reinvestment cycles," *Review of Economic Statistics*, 1938.

Mack, *op. cit.*, ch. 8.

J. Meuldijk, "Der Englische Schiffbau während der Period 1870–1912 und das Problem des Ersatzbaues," *Weltwirtschaftliches Archiv*, 1940.

National Bureau of Economic Research, *Cost Behavior and Price Policy* (New York, 1943), ch. VII, sections 3 and 4; and appendix C.

R. C. Blanchard, "A replacement policy that shares responsibility," *American Machinist*, 1931, pp. 729–740.

A series of articles by P. T. Norton, G. S. Tracey, R. F. Runge, H. K. Spencer, H. P. Bailey, J. H. Jackson, and D. S. Linton, *ibid.*, 1935.

P. de Wolff, "The demand for passenger cars in the United States," *Econometrica*, 1938.

G. Terborgh, *Dynamic Equipment Policy* (New York, 1949).

S. L. Horner, *et al.*, *Dynamics of Automobile Demand* (General Motors Corporation, 1939).

Cf. also, J. S. Bain, "The relation of the economic life of equipment to reinvestment cycles," *Review of Economic Statistics*, 1939; and B. Caplan, "Premature abandonment of machinery," *Review of Economic Studies*, 1940.

[2] The derivation of equation (2) from (1) is:

$$\pi_{1t} = \sum_{t}^{t+n} \frac{r\Upsilon}{(1+i)^n} - \sum_{t}^{t+n} \frac{c_1 \Upsilon}{(1+i)^n}$$

$$\pi_{2t} = \sum_{t}^{t+n} \frac{r\Upsilon}{(1+i)^n} - \sum_{t}^{t+n} \frac{c_2 \Upsilon}{(1+i)^n}$$

where r is the price at which output sells. Substituting for π_{1t} and π_{2t} in (1), the new machines, and c_2 with the old. n should represent the economic life of the new equipment. The problem is how to determine *ex ante* this economic life. To do so properly we must be able to foresee the future course of technical development of the equipment over all time.[1] This degree of foresight is impossible, and it appears that in consequence firms fall back on rule-of-thumb methods. n, therefore, is arbitrary and also short. The bulk of equipment is expected to pay for itself in at most 5 years.[2] Lastly, i is the rate of interest used in discounting.

It is possible to draw some conclusions about the various hypotheses summarised on pp. 281–283 by examining how each of the items in equation (2) is likely to behave during the trade cycle. When we are thinking of the economy as a whole, Y must stand for gross national income. The influence of Y is then clear. It stimulates replacement in the upswing, and stimulates it the more the stronger is the upswing. Similarly Y makes for the postponement of replacement in the downswing. Its influence is possibly stronger than appears from equation (2). It is often difficult to know just when the saving on any machine or group of machines is sufficient to justify replacement.[3] The timing of replacement may be a matter of chance: when somebody in the plant or a visiting salesman happens to notice the possibility of lowering costs by replacing some equipment. More likely, attention is given to replacement when times are good and funds are available. Funds come primarily from gross profits. In so far as these vary with Y, the influence of Y on replacement is strengthened. The pull exerted on replacement by Y is at the basis of Kuznets's qualification of the age hypothesis[4]; and thus possibly, as he argues, underlies the assumption made by other

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$$\sum_{t}^{t+n} \frac{rY}{(1+i)^n} - \sum_{t}^{t+n} \frac{c_1 Y}{(1+i)^n} - \sum_{t}^{t+n} \frac{rY}{(1+i)^n} + \sum_{t}^{t+n} \frac{c_2 Y}{(1+i)^n} > P_{1t} - S_{2t}$$

$$\therefore \quad \sum_{t}^{t+n} \frac{Y}{(1+i)^n} (c_2 - c_1) > P_{1t} - S_{2t} \qquad (2)$$

[1] We can decide how long to keep the new machine only when we know how soon a superior model will appear. But simply to know the time of appearance of the first superior model is not sufficient. It may pay to ignore it and wait for the second model, if, when the first appears, further developments are regarded as imminent. And so on for the third and subsequent models.

[2] The published evidence relates to American manufacturing industry and is summarised in Terborgh, *op. cit.*, Ch. XII.

[3] This point may be seen very clearly in the articles from the *American Machinist* referred to in fn. 1, p. 285. Cf. N.B.E.R., *op. cit.*, p. 326.

[4] Above, p. 283.

writers that replacement depends solely on the level of output. Undoubtedly, Y has a powerful effect on replacement, but equation (2) also points to the other forces that are at work. We must, therefore, reject this assumption. At the same time, the fluctuations of Y persuade entrepreneurs to take advantage of the flexibility in the life of their plant[1] to put off replacement in the downswing and to concentrate it in the upswing. This suggests that we should reject Hicks's conclusion that replacement cycles are so damped that they may be ignored.[2]

$(c_2 - c_1)$ is subject to a number of influences. The arguments outlined early in section (i)[3], that equipment falls out of use in the downswing and that in consequence Y can rise in the upswing faster than the stock of capital equipment, supports Somers's contention about variations in user cost.[4] User cost is likely to be greater at high levels of output than at low. There is, however, one factor that is likely to counteract the effects of the level of output on wear and tear. In general, maintenance and repairs are curtailed in the downswing, while efforts are bent towards making good the effects of neglect when output is rising.[5] One cannot say unequivocally that user cost will strengthen the tendency for replacement to rise and fall with Y. Moreover, there are forces that make $(c_2 - c_1)$ act in the opposite direction to Y. If replacement is postponed during the depression, c_1 falls relatively to c_2 for two reasons: (i) plant is getting older and therefore c_2 rises; and (ii) technical development is usually not hindered by depression and as a result the potential c_1 is always falling. It is impossible to say just how strong will be the effect of this increase in $(c_2 - c_1)$, for that depends on the rate at which Y is falling relative to the rate at which $(c_2 - c_1)$ is rising. There is no reason why the relation between these rates should be constant from cycle to cycle. It might happen that the increase in $(c_2 - c_1)$ is sufficient to cause a rise in replacement which would help to explain the lower turning point. It will certainly happen that this increase will hasten the revival of replacement when the upswing begins. On the basis of the factors considered so far, the movement of $(c_2 - c_1)$ will stimulate a considerable bunching of replacement in the early period of the upswing. If such a bunching occurs, $(c_2 - c_1)$ will offset Y in the later part of the upswing, just as it does in the later part of the downswing. This tendency to offset occurs because the early upsurge of replacement leaves industry with comparatively up-to-date equipment. That is to say, c_2 falls sharply and some time must elapse before the gradual fall in c_1 and the gradual rise in c_2 are sufficient to encourage replacement. A temporary lull in replacement is quite plausible, particularly as the other forces that lead to discontinuity of investment are effective here. But as with the upturn, one cannot say whether the fall in $(c_2 - c_1)$ will be soon enough or large enough to explain the downturn. It will help Y in inducing a postponement of replacement where once the downswing has begun. This stronger force making for postponement early in the downswing increases the possibility that $(c_2 - c_1)$ may rise sufficiently to explain the upturn, which in turn makes more plausible the argument that a fall in $(c_2 - c_1)$ accounts for the downturn. But that is all on the assumption that other things are equal; and it is more likely that other things change to at least some extent from cycle to cycle. It assumes, moreover, that the entrepreneur always knows just when replacement is worth while; and, as we have seen, this is by no means always a valid assumption. Finally, it assumes that we are discussing firms that are not growing rapidly. In rapidly expanding firms the age distribution of equipment is likely to be so skewed that no bunching of replacement occurs early in the upswing.[1] For our present purposes this qualification may be neglected, because it is doubtful whether the acceleration principle has much significance for such firms anyhow.[2] All in all, we must view with caution the thesis that replacement explains the turning points; but it is interesting to note that the movements of $(c_2 - c_1)$ may yield the same effects as the echo theories[3] and without their special assumptions about the lifetime of machines. Indeed, a consideration of the various forces affecting $(c_2 - c_1)$ helps us to see that, while the age structure of equipment is important, replacement cannot be regarded as a simple function of age. Furthermore, $(c_2 - c_1)$ makes it quite clear why it is impossible to accept the thesis that replacement depends solely on Y. One implication of this conclusion is that we cannot accept Frisch's contention that gross investment may approach asymptotically some level and stay there.

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[1] Above, p. 283.
[2] Above, p. 283.
[3] Above, p. 275.
[4] Above, p. 283.
[5] Cf. Hultgren, *op. cit.*, pp. 169–175.

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[1] Cf. Horner, *op. cit.*, chart 12, p. 49.

[2] Cf. p. 271.

[3] See Einarsen *op. cit.*; and Tinbergen, *op. cit.*, *Econometrica*, 1935.

The behaviour of P and S need not detain us for long. P consists of the prices of capital equipment and of the costs of installing it. Kalecki's index of the prices of capital goods shows that they do not change much, and that such changes as do occur show no consistent pattern *vis-à-vis* the cycle.[1] The costs of installation include both direct costs and also indirect costs in the form of interference with current production and the diversion of managerial energies. Their effects have already been discussed and the conclusion has been reached that generalisation is hazardous. So far as they may be significant they have already been allowed for in the discussion about $(c_2 - c_1)$. S probably supports the effects of Y. Both the second-hand market and alternative opportunities improve as Y rises and deteriorate as it falls. It is difficult, however, to assess the significance of S.

The general conclusion to be derived from this discussion is that we may point to certain factors that have a significant influence on replacement. Furthermore, the analysis shows that we must reject the various hypotheses outlined at the beginning of this section. We cannot regard replacement as a function solely of Y or of age; nor can we safely assume that replacement cycles gently die away. To go beyond this, however, is most difficult. This is so for two reasons: (*a*) we cannot say at what stage of the cycle replacement becomes profitable or unprofitable; and (*b*) even if we knew the answer to this question, we should still be unable to say much on the timing of replacement. The major reason for the first difficulty is the problem of predicting the behaviour of $(c_2 - c_1)$ relative to that of the other forces in the cycle. To do this we should require a closed model, and one based on a more complete theory of investment than the fragment under discussion here. The second difficulty arises from the fact that equation (2) tells us when replacement becomes profitable, but not when the decision to replace is taken. We are thwarted in our attempt to state the behaviour of gross investment influenced by motives for expansion as well as those for replacement. We can say no more, therefore, than that it is difficult, if not impossible, to separate replacement from net investment ; and that there are strong forces acting on the motive for replacement. It is in consequence unlikely that gross investment will slavishly follow the pattern suggested by the acceleration principle. It is a weak conclusion, and clearly we must pursue our inquiries further.

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[1] M. Kalecki, *Essays in the Theory of Economic Fluctuations* (London, 1938), p. 39, table 3. This index should, perhaps, be viewed with caution.

(iii)

In general the acceleration principle is expressed as a theory relating current output to current investment. Sometimes lags are introduced and investment is regarded as a function of the changes in output during a past period. A number of critics have made the pertinent comment that no satisfactory theory of investment can be constructed without some provision for expectations. Indeed even the simplest formulation of the acceleration principle contains an implicit assumption about the future behaviour of output : it is expected to remain at the level which it has just reached. There is no dispute whether the assumptions made about anticipations affect the acceleration principle. The difference of opinion turns on the nature of that effect. There are three main schools of thought.

Professor Tinbergen stresses the distorting effects of errors of judgment. The ideal at which the entrepreneur aims in the adjustment of his capital equipment may be " the adaptation as set out by the acceleration principle. But since the adaptation must always be directed towards an unknown future demand for consumers' goods, it is only natural that errors may be committed ".[1] The consequence, Tinbergen argues, is that the acceleration principle cannot accurately depict the formation of investment decisions. Other writers take the view that the explicit introduction of expectations helps to explain why statistical studies have in general yielded such unfavourable results for the acceleration principle. Such studies have sought the degree of correlation between all changes in output and all changes in the stock of capital equipment. A. S. Manne has suggested that since the entrepreneur is gifted with a certain measure of foresight he will be able to distinguish, at least in part, between those changes in the demand for his product that are purely transitory and those changes that justify some extension or contraction of his plant.[1] If this is so, empirical research must make some distinction between these categories of movements in demand. It will be noted, however, that this attempt to shield the acceleration principle from one criticism reinforces the argument that investment is discontinuous.[2] *Prima facie* another attempt to show that the acceleration principle can be made more useful by the introduction of anticipations is that by Professor Wright. Wright, however, uses the phrase " acceleration principle " to refer to the purely technical relationship outlined on page 272 above. His introduction of expectations results in a complete rejection of the principle that is being discussed here. " We can take the matter further," he writes, " and divorce [investment] altogether from consumption,"[3] making it depend on autonomous changes in entrepreneurial expectations or on innovations. His attitude, therefore, is more akin to Tinbergen's than to Manne's.

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[1] Tinbergen, *Econometrica*, 1942, p. 139 ; cf. also J. M. Clark, *Strategic Factors*, *op. cit.*, p. 40 ; and Pigou, *op. cit.*, p. 108, esp. footnote. Clark and Pigou do not find these errors in forecasting very harmful to the acceleration principle.

Many writers who refer to the effects of expectations on the acceleration principle are eclectic and recognise that there are valid elements in the arguments for and against the principle. " The supposition which underlies the rigid application of the acceleration principle is that the present level of demand is assumed to rule in the future also. Now it is very doubtful whether it is possible to generalise as to the exact behaviour of producers in this respect. Fortunately for the broad result, however, it is sufficient to indicate a certain range of expectations as probable and to eliminate others as highly unlikely."[4] There can be no doubt that the eclectic approach is the safest one in view of our very restricted knowledge of how expectations are formed. The position has been summed up very aptly by Bissell: only when we have a workable theory of expectations shall we know just how far the acceleration principle must be qualified.[5]

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[1] Manne, *op. cit.*, pp. 96–97. See also, J. W. Angell, *Investment and Business Cycles* (New York, 1941); " Regardless of the state of present demand, entrepreneurs will not increase present capacity unless their anticipations for the future warrant the step." (p. 89, fn.).

Kuznets argues, *op. cit.*, p. 229, that the more durable the capital equipment the more wary will the entrepreneur be before he installs additional equipment in response to a rise in demand. This is true, however, only on certain assumptions about the age structure of existing equipment.

[2] Cf. above, p. 281.

[3] D. McC. Wright, " A neglected approach to the acceleration principle," *Review of Economic Statistics*, 1941, p. 101.

[4] Haberler, *op. cit.*, p. 343; and also pp. 102 and 306. Cf. Somers, *op. cit.*, pp. 83-86 and Long, *op. cit.*, pp. 44–55.

[5] Bissell, *op. cit.*, p. 34.

One or two comments, however, are possible in an attempt to limit somewhat the range of uncertainty about anticipations and the acceleration principle.

To some extent memories of the past affect reactions to the events of the present. Firms that have known violent fluctuations in the demand for their output are likely to be hesitant about expanding their plant in the face of a current growth in demand.[1] The result is that during the course of a trade cycle different firms will respond to market changes with differing speeds and to differing degrees; and their various reactions will depend on their past experiences.[2]

A second factor that delimits somewhat the applicability of the acceleration principle is that firms in their investment policy may be concerned with distant possibilities that are divorced from the current movements of markets.[3] Strictly, however, this takes us into the territory of those criticisms that query the importance of induced investment. This territory is out of bounds.

In the light of these two arguments we may say that the acceleration principle is fully applicable only to induced investment in firms that have not suffered too greatly from ups and downs of demand. With regard to the firms that have not so suffered, we seek here to discuss only one qualification to the acceleration principle. In a world of imperfect foresight what effect has the current level of profits on the confidence with which entrepreneurs view the future? This involves us in the arguments as to the relative merits of the profits principle and the acceleration principle. It is more convenient to consider the effects of profits on anticipations together with these other arguments.

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[1] E.g., the policy of the United States Steel Corporation as recorded in S. D. Merlin, *The Theory of Fluctuations in Contemporary Economic Thought*, p. 117, fn. 54. Also, Heller, *op. cit.*, p. 100: "There has been some tendency to regard the 1946–1950 markets as 'too good to be true'. Productive capacity has been held below levels needed to meet peak demands because the long-run plateau was expected to be lower."

[2] In so far as the firms with the most unpleasant memories are in the capital goods industries, some such hesitation to invest even when faced by sharply rising demand must lie at the basis of the explanation of the downturn given by Goodwin, especially in *op. cit.*, *Econometrica*, 1951, and by Clark in *Overhead Costs*, *op. cit.*, pp. 393–394. Clark and Goodwin suggest that the rate of growth of income is slowed down by this reluctance of the capital goods industries to add to their equipment.

It will be noted that in this section we abandon the simplifying assumption that output and demand may be treated as one.

[3] D. H. Robertson, *Essays in Monetary Theory* (London, 1939), p. 179; and Lundberg, *op. cit.*, p. 254. For some empirical evidence that raises doubts about the importance of these long-range anticipations, cf. Gort, *op. cit.*, pp. 81–84. It will be noted, moreover, that the introduction of expectations makes it exceptionally difficult to maintain the distinction between autonomous and induced investment. It is not discussed here in order to limit the scope of this paper.

The case for the profits principle, which has been put most forcefully by Tinbergen,[1] rests on two arguments: (*a*) in the uncertain world of reality the entrepreneur falls back on rule-of-thumb methods in trying to evaluate the future, and the present level of profits provides that rule-of-thumb; and (*b*) firms prefer internal sources of finance and thus profits must have a dominating influence on investment. He supports his theoretical arguments with correlation analyses of a number of time series. The profits principle has more than one form. It is sometimes argued that the level of profits determines the level of investment; and sometimes that what is important is the rate of profit, where this " is determined *grosso modo* by the level of national income and the stock of capital equipment."[2] There are arguments in favour of both these theses, but they favour the second more than the first.

Let us examine first profits and their effect on expectations. It is not plausible to argue that expectations will be based solely on the rule-of-thumb provided by the current level of profits. If entrepreneurs are as uncertain as this implies about the future market they are unlikely to invest at all.[3] This argument is strengthened by the fact that some at least of the decisions on an investment project initiated in the present can be put off until the situation is clearer.[4] The most, therefore, that can be said of the effects of profits is that they may distort expectations. It is worth dwelling a little longer on this distortion. It is likely to be the more severe the longer is the gestation period. When the gestation period is long a rise in demand will be met by a rise in price rather than by an increase in output. The individual producer has to decide by how much demand has risen in real terms. It is reasonable to suggest that his vision is likely to be distorted.[5] We are now in a better position to see the two horns of the dilemma on which the acceleration principle finds itself.[1] On the one hand, firms may reach capacity in terms of definition (*c*)[2]. Where this happens a case can be made for the acceleration principle, but one which leaves it weak in matters of timing. On the other hand, capacity in terms of definition (*a*) may be reached. Were the adjustment of plant to changes in output instantaneous, the acceleration principle would explain both the timing and the amount of investment once this capacity was reached. But instantaneous adjustment is not possible. Moreover, the gestation period must grow if, during an upswing, more and more firms reach capacity (*a*). In short, where there is surplus capacity according to definition (*a*) the acceleration principle encounters one serious obstacle; and where such surplus capacity does not exist it encounters another.[3]

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[1] See in particular, his *Statistical Testing*, *op. cit.*, *passim*; and Tinbergen and Polak, *op. cit.*, ch. 13.

[2] Kalecki, *op. cit.*, p. 133. Models based on both forms of profits principle are in Tinbergen and Polak, *op. cit.*, pp. 195–206.

[3] On the importance of market forecasts, see W. E. Wright, *Forecasting for Profit* (New York, 1947), pp. 2 and 10; and Heller, *op. cit.*, p. 99.

[4] Gort, *op. cit.*, p. 82; and A. G. Hart, " Anticipations, business planning, and the cycle," *Quarterly Journal of Economics*, 1937, p. 286.

[5] The effects of a long gestation period on expectations is developed at length in Aftalion, *op. cit.*; cf. also J. Tinbergen, " Ein Schiffbauzyklus ? " *Weltwirtschaftliches Archiv*, 1931; T. C. Koopmans, *Tanker Freight Rates and Tankship Building* (Haarlem, 1939), pp. 165ff.; and J. A. Schumpeter, *Business Cycles* (New York, 1939), vol. II, pp. 533–535.

The above argument, so far as it supports the profits principle, favours the level of profits as a determinant of investment. The case for this variant of the profits principle can be strengthened. The acceleration principle assumes (*a*) that where a firm needs outside capital for an investment programme it has no hesitation whatever in seeking it, and (*b*) that the supply of credit is perfectly elastic. We are here concerned with (*a*).[4] It is an unwarranted assumption. There is some evidence that firms prefer internal sources of finance to borrowing either short or long.[5] Profits are a major source of internal finance. The level of profits is, therefore, a major factor in determining how much a firm can invest and when it invests. Profits exercise, therefore, over both the amount and the timing of investment, an influence that is permissive,[6] except in so far as the availability of funds stimulates some inquiry into the openings for investment[7] or distorts expectations about such openings.

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[1] Cf. above, p. 277.

[2] Cf. II (i), esp. pp. 277–278.

[3] It was recognition of this obstacle that led J. M. Clark to suggest that there is always some "surplus capacity". Cf. above, p. 277, and *Readings*, *op. cit.*, pp. 256–257.

[4] For a discussion of (*a*) and (*b*) cf. Tsiang, *op. cit.*, pp. 331–335.

[5] See, e.g., the case studies in J. K. Butters and J. Lintner, *Effect of Federal Taxes on Growing Enterprises* (Boston, 1945); and Heller, *op. cit.*, pp. 101–102.

[6] "But as repeated references to reliance on internal funds have indicated, finance is more a barrier to capital investment than a 'thrust' towards new projects." Heller, *op. cit.*, p. 101. See also the answers to the question on the "effect of the abundance or scarcity of liquid resources on investment in fixed plant", in J. E. Meade and P. W. S. Andrews, "Summary of replies to questions on the effects of interest rates," *Oxford Economic Papers*, 1938, pp. 25–8.

[7] Cf. the discussion about replacement on p. 286 above.

We must not, however, press too far the argument in favour of the level of profits. Undoubtedly there are strong reasons for looking upon the level of profits as the determinant of investment, but only where the openings for investment exceed the funds available.[1] A particularly important weakness of this variant of the profits principle is that it assumes that so long as profits remain at a given level, investment will continue to be constant regardless of the effects of past investment on the stock of equipment. This is not a valid assumption. " Indeed, if in a given period there is a high level of profitability which induces investment this will not continue for the subsequent period because all investment plans will have already been undertaken under the influence of high profitability in the initial period ".[2] This defect can be avoided by taking the rate of profit as the determinant of investment, for then we allow for the stock of capital equipment.

Within the restricted limits of this survey the determinants of investment may be summed up. We may write :

$$I = \beta\,(K_D - K_A), \text{ where}$$

(*a*) β is the inverse of the gestation period. Hitherto we have been able to treat the decision to invest and the actual execution of investment as one. The introduction of the gestation period makes it necessary to have a distinction ; and I here refers to the process of investment.

(*b*) K_D is, for want of a better term, the desired level of capital stock.

(*c*) K_A is that part of the existing equipment that is considered efficient enough to be kept in operation.

This equation differs in certain respects from the acceleration principle. In the first place, it allows for some form of gestation period. In the second place, it differs as regards the timing of the decision to invest and as regards the proposed volume of investment. Thus K_D depends, for timing and amount, not solely on the level of national income but also on profits, which affect it in the ways outlined above.[1] To some extent, the essential characteristic of the acceleration principle is preserved in the difference between K_D and K_A. But, whereas the principle neglects replacement and thus the movements of K_A, those movements are allowed for in $(K_D - K_A)$. Thus I refers to gross investment, the timing and amount of which are strongly influenced by profits. That this is so is plausible in view of the difficulties experienced in II (i) and II (ii), where we were discussing the timing of net and replacement investment.

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[1] It will be noted that once again we encounter the difficulty of distinguishing between induced and autonomous investment. Presumably they are both financed from the same source and thus their movements cannot be fully independent.

[2] M. Kalecki, " A new approach to the problem of business cycles," *Review of Economic Studies*, 1949–50, p. 61.

III

The acceleration principle may be criticised on three counts. It purports to give a precise explanation of the timing of investment where in fact it is vague. This is the conclusion of II (i); and it is supported in some measure by II (ii). This latter section also suggests the inadequacy of any theory of investment that is restricted to net investment. Finally, we argued on p. 280 that there is a strong element of truth in the acceleration principle: namely, that the amount of an entrepreneur's investment is governed in some measure by a comparison of the output he can most efficiently produce with his existing plant and the output at which demand conditions now justify him in aiming. II (iii), however, presents the arguments in favour of profits as a determinant of investment, both in matters of timing and of amount. Thus the essential appeal of the acceleration principle is somewhat muted, but mainly in that the level of profits may curb the enthusiasm to invest engendered by the rate of growth of output.

In sum, there is an element of truth in the acceleration principle; but it is an element that is so heavily overlaid by other factors that the acceleration principle by itself is inadequate as a theory of investment. Unfortunately, it is not at all clear what theory we should put in its place. $I = \beta (K_D - K_A)$ meets the criticisms of the acceleration principle; but it is no more than a summary behind which lie some very complex relationships. It is certainly not neat and easy to handle. Much of the appeal of the acceleration principle has lain in these very characteristics, but it may be wondered whether they should always be regarded as commending a theory of investment. There is sufficient similarity in the factors that determine investment from one cycle to the next to enable us to pick out certain salient factors and decide that those are the ones we must watch. There is not sufficient uniformity to justify our attaching fixed coefficients to these factors. The precise theory is easier to handle, but its precision should make it suspect. The many qualifications with which our conclusions have been hedged are in part an admission of ignorance; in part also they spring from a desire to avoid placing undue emphasis on the constancy of economic life.

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[1] The case for the profits principle would be strengthened if costs vary cyclically as has been suggested, e.g., by W. C. Mitchell, *Business Cycles and their Causes* (Berkeley, 1951). The case for this theory is not considered here, as it does not fall within our terms of reference.

The London School of Economics.

The Pricing of Manufactured Products

By Ronald S. Edwards

As a student of economics who was once an accountant I have been following with some perplexity the recent controversy in this country and the United States on the influences determining prices in manufacturing industry.

First, I am surprised that the description of procedures well known and long practised in industry should apparently be regarded in some quarters as a significant discovery. The practice of preparing estimates on the basis of prime cost (raw materials, direct labour, etc.) plus overhead rates computed in a variety of ways, is described in scores of text-books on cost accounting. I had supposed that the existence of this approach to the task of price-fixing, especially in multi-product firms, was common knowledge among economists. Secondly, I am surprised that the existence of these procedures should have led to serious questioning of the validity of the marginal approach in general economic analysis. Conventional cost estimates provide rules of thumb, which are especially important where decisions have to be delegated. These rules of thumb are not always as satisfactory as they might be and sometimes they are downright stupid. But it surely does not follow that, because mistakes are sometimes made in business practice, the marginal analysis, which is merely a method of stating formal qualities of sensible behaviour, is inapplicable as a general approach.

The doubts which have arisen regarding the significance of marginal analysis as a working assumption may, I think, be due to insufficient empirical investigation. Those who argue that the automatic basing of prices on conventional cost statements is the rule rather than the exception have not, it seems to me, taken adequate account of the informal and unrecorded stages in the price-fixing process. Before the preparation of the cost estimate, and between its preparation and the actual determination of the price, discussion usually takes place among those responsible about the assumptions underlying the cost figures and about the market situation. This process of examining and reviewing the pros and cons, of considering the likely effect of a little more or a little less in product quality, in output, in price, in selling effort, is none the less important because it takes place over the telephone or while walking round the factory, or because the actual details of the discussion may very soon be forgotten by those who took part. But that this informal stage in price-fixing frequently exists, and is often significant, few who have had much actual experience of business would deny.

The purpose of the present note, however, is not to advance my own views on price policy and practice but to report statements made by senior officials of two firms with whom I happen recently to have been discussing these questions. These statements were not made with a view to publication, and they are not therefore in a polished form, but I think they throw an interesting light on the problem under discussion.

The first concerns a firm of machinery manufacturers, a director of which I had asked to set out in some detail, and with the necessary forms, the stages by which the selling price of a new machine is fixed in his business. He prepared a dossier containing:

A. Schedules of manufacturing operations in the production of components.

B. Schedules of operations in assembly.

C. Details of components to be manufactured in the works, direct labour times, and jigs.

D. Details of components to be bought out or sub-contracted, cost of all raw materials, and patterns.

E. The build-up of estimated works cost of the machine.

F. The build-up of the proposed selling price.

Limitations of space preclude reproduction of all these documents but I set out below Schedule E in abridged form and Schedule F *in extenso*.

SCHEDULE E
(*abridged*)

The Schedule starts with a description of the machine, including notes on finish, on accuracy and on batch size. It then summarises the various costs as follows :

		£
MATERIAL (ex Schedule D)		
Raw—Major Castings	£	
All other Castings	£	
Stampings and Forgings	£	
Bar	£	
Specialised Bought-out Components		
Sub-Contracted Items		
DIRECT LABOUR (ex Schedule C)		
Producing Components		
At Assembly Stage		
OVERHEADS at..........% of Value of all Direct Labour		
ESTIMATED WORKS COST TO MANUFACTURE		
SPECIAL FEATURES		
Electrics inc. Cost of wiring-up		
Equipment		
AMORTISATION—JIGS AND FIXTURES (ex Schedule C)		
Estimated Outlay £..........;		
Amortised on..............M/cs.	per Machine	
PATTERNS (ex Schedule D)		
Estimated Outlay £..........;		
Amortised on..............M/cs.	per Machine	
TOTAL OF ALL THE ABOVE		
CONTINGENCY ALLOWANCE..........%		
GRAND TOTAL ESTIMATED WORKS COST PER MACHINE (Transferred to Schedule F)		

Signed..............................Chief Estimator and Planner. Date............

SCHEDULE F

Date............

BUILD-UP OF SELLING PRICE PER MACHINE

	£
Detailed Estimate of Works Cost (ex Schedule E)	
Add Cover for Administration and Selling Expenses	
Add for Net Profit	
PROPOSED SELLING PRICE	

Weight of Machine
Anticipated Sales per Year
Has any price been quoted yet ?
Selling Price of.......................
(the Company's nearest comparable Machine) £......
Weight of this Machine

COMPETITORS' DETAILS

Name
Machine Description ; Selling Price £
Probable Quantity Sold per Year ; Weight

Name
Machine Description ; Selling Price £
Probable Quantity Sold per Year ; Weight

OBSERVATIONS

After a seminar discussion I wrote to the responsible director of the firm raising a number of points of detail and ending my letter with a reference to recent discussion on the relationship between cost estimates and selling price. "I have been pointing out," I said, "that although you work out estimated cost by starting with materials and labour, adding various overhead rates and then an allowance to cover administration, selling expenses and a notional net profit, that figure is subject to a great deal of discussion and examination in relation to long-term considerations, detailed market forecasts, existing models of your own that the new model may partly displace and so on, and that the actual price chosen may differ quite significantly from the price arrived at by 'costing up'. I wonder whether you could give us—not in absolute figures, because I can well imagine that you may prefer not to do so, but in percentages—the relationships in some actual cases between the estimates of works cost and the actual prices."

The following is an extract from the reply :

"Any determination of price has to take volume into account. When a large proportion of one's capital is locked up in fixed assets and the necessary management, personnel and fixed expenses associated therewith, one must ensure that prices are not set so high as to cause one to lose more in lack of recovery of fixed production overheads than one gains by theoretical addition to gross profit by a higher price. This means that anticipations of quantities to be sold at varying prices must be worked out in a series of budgets showing the effect on the total final profit of the Company, and that combination of quantity and price which gives the best final yield is obviously the combination which we shall adopt, thereafter modifying our views according to whether experience of sales corresponds to the Sales Department's anticipations.

"Obviously, if we had cut our margin finer than we wanted to and we found orders came flooding in, then we should push our prices up a little. Contrariwise, if we had fixed what we considered an adequate margin of profit on our selling price but the quantities were not forthcoming, then we should have to have a reduction in price.

"The other factor of course is this. If we know that a competing model is selling at £*X* and our features are worth a little bit more, we can say that the maximum price that we are likely to be able to obtain for our product is £*X* plus £*Y*. If our estimated costs do not give us a reasonable margin, then we have to turn the job back to the Design Department to re-consider design with a view to eliminating features which have been put in very often at the request of the Sales Department who, although requiring the feature, are not prepared to ask the customer to pay an additional sum for it. Sales Departments are very fond of demanding additional features at no extra charge.

"The general situation is that your competitors can produce no more miracles than you can, and if they can produce particular articles to sell at a price that will show a reasonable profit, then your own organisation ought to do the same. It is, however, particularly necessary in considering what your competitor does to be able to form a fairly accurate opinion as to whether his Accounts Department are advising him on the basis of reasonable cost ascertainment or whether, as is sometimes the case, his Sales Department have determined on a price and their cost methods are not good enough or even non-existent so that they do not know that they are losing money on the product.

"Just as a rough indication of the possible variations in the relationship between the estimated works cost and the actual selling price of different machines the following examples of price build-up may be given:

1. Works cost plus 8%.
2. Works cost plus 12%.
3. Works cost plus 35%.

"The selling and administration costs have to be taken out of these percentage margins and only the balance (if any) is net profit.

"The point which Mr. —— makes also has to be very much borne in mind. If you wish to develop in your factory a new product which has been manufactured by your competitors for 20 or 30 years, you must expect to fix your prices at such a level that will enable you to obtain orders, regardless of cost and profit, for such period as will enable you to train your workmen, revise your production methods and establish the faith of your customers in your production. This, of course, is one of the trickiest avenues of commerce where persistence sometimes throws good money overboard, but on other occasions faintheartedness throws away a promising product for the lack of courage to sustain the further additional losses which will see you over your initial trial periods into the period of established success."

I now set out some extracts from a memorandum prepared by the chief accountant of a pottery firm discussing the problem of price-fixing in his industry. I cannot quote the complete document as it is long and some of the contents are confidential but the general tenor is given.

"... there are a great many factors entering into price-fixing and of these far and away the most important is the price the customers are willing or can be induced to pay. It is not infrequently imagined that in price-fixing the manufacturer arrives first at a cost of his goods (with the aid of a cost accountant), adds on a margin for profit (usually too much!) and thus arrives at the price at which he can sell his goods to the public. This may be to a certain extent true of the retail merchanting trade, where 'cost' is to a large extent an irreducible figure, but nothing could be farther from the truth in manufacturing industry. In fact the problem which confronts industry today is not to sell goods for more than they cost, but to manufacture goods at less than they can be sold for . . . .

"Price-fixing is not a scientific operation, nor is it the result of a well defined mathematical formula. A mathematical formula or a cost estimate may be employed for arriving at a selling price as a basis of discussion, but it is my experience that costing, in relation to price-fixing, is almost invariably a form of what psychiatrists would call 'rationalisation'. That is to say, that the manufacturer has a 'hunch' as to the price at which his article can be sold, and makes use of 'costing' or 'estimating' to justify that price.

"The 'hunches' of the manufacturer are not, however, to be disregarded. Although he may be unaware of the processes of thought by which he has arrived at that 'hunch', it is in fact the distilled essence of his knowledge and experience, and as such is of very much greater value for this purpose than all the involved calculations of the cost accountant. That is not to say that the accountant has no part at all to play in price-fixing, but that he is by no means the final arbiter in the fixing of selling prices. There is a popular misconception particularly prevalent amongst Government departments and political theorists on this point, and it cannot be too strongly emphasised that the deciding factor in price-fixing is the price which the consumer is willing, or can be induced, to pay. The consumer's willingness may be influenced by the *average* cost of the industry manufacturing that article, or similar articles, but is not influenced to any appreciable extent by the costs of one individual manufacturer.

"The accountant's role, as I see it, is two-fold. In the first place, if the price-fixing is conducted at an Industry level, such as through a Trade Association or a Government department, the accountant's determination of average costs of the industry may have a decisive effect on the selling prices to the consumer, although even in this case the effect of alternative products made of different material but having a similar function must not be overlooked (e.g. spun concrete drain pipes as an alternative to salt-glazed pottery drain pipes).

"Secondly, the function of the accountant is to demonstrate the financial consequences of a suggested selling price. If, as a result of consideration of these consequences, the manufacturer decides that selling prices must be increased, and in fact is able to do so, it demonstrates the manufacturer's own ineptitude in having previously sold those same goods at a price lower than he need have done, and the accountant's function has been to point out that ineptitude, and not to fix the selling price. The criterion of the selling price in a free market is 'What the market will bear'. There are, however, other factors which enter into this consideration; a higher price although theoretically obtainable, may be obtainable only for a lower volume of goods, and a lower output from the factory might increase costs, possibly making the business even less profitable. Conversely a lower price might increase the demand which in turn might make possible cost reduction for a higher output. These are all factors which the business executive who fixes prices must bear in mind. Again, the manufacturer's choice must be influenced by other considerations, such as the extent to which his factory is working to capacity, or the extent to which demand is likely to continue in order to justify an expansion of his capacity.

"... There is a considerable element of uncertainty and risk in price-fixing. It is not backing a dead cert. and no amount of scientific 'costing' can make it so. The element of risk can be minimised by monopoly, or by control of prices by the State or Trade Association based on 'average costs', but in a great many cases—it may well be the majority of cases—a manufacturer is manufacturing 'to a price', a price which has been determined for him by a great number of external circumstances. It is his business to know what that price is and so to arrange his manufacturing that it produces an article which is acceptable at that price, and at the same time produces a profit....

"Where there is a range of articles offered for sale, there is always a scale of prices. In this industry the origin of the scale is usually lost in antiquity, and it was probably originally conceived very much on a 'hit and miss' principle. But over the years the scales have been adjusted from time to time, and have become accepted both by the trade and the public as a true relationship between the various articles in the range. So that at today's date variations in price are, almost without exception, a bulk variation of the scale of prices and not variations within the scale. This acceptance of the existing relationship between articles in the scale does not necessarily mean that all the articles in that scale are equally profitable—far from it. Custom, and indeed commercial prudence, will demand a lower margin of profit on popular articles than on the speciality articles. This is illustrated by one of the few examples to my knowledge of variations in price within a range of prices. In the sanitary earthenware trade there has always been a standard size of lavatory basin and closet which formed the hard core of a factory's output; this was sold at a cut price, since bulk production of such lines was essential to the continuity of a factory. In addition, however, there are specialities—large sizes, different shapes, and colours, etc., for which a much higher margin of profit is obtained, and the successful prosecution of the business depends in no small measure on maintaining a nice balance between the two types of business. With the housing shortage, however, and with the greater part of new building in the hands of the Government, the demand shifted to almost exclusively the standard sizes on which there was a very low margin of profit—so low that the overall margin of profit was inadequate, and agreed to be inadequate by the Government department concerned with the control of these prices. As a result a price adjustment was permitted to adjust the selling prices of these two articles only out of the entire range. In all probability such a change is possible only in a controlled market, and would be impossible in a free market. . . .

"To sum up, I have tried to emphasise that the most important factor in fixing prices in the pottery industry is the knowledge of what the customer will pay and that this knowledge is acquired by experience. The customer's willingness to pay may be influenced by average costs for the industry, but to no marked extent by an individual manufacturer's costs, and it may also be influenced by the selling price of alternative materials. The customer's awareness of the average costs in the industry depends on:

(1) Government cost investigations in a controlled price market.

(2) Trade Association cost investigations where Trade Association price rings are effective.

(3) Competitive prices in a free market.

"In addition the customer's willingness to pay may be conditioned in a large degree by custom, and a price once charged is difficult to adjust upwards except in times when demand greatly exceeds supply."

Perhaps it is relevant to say that, in my experience, the attitude to pricing displayed by these correspondents is quite common among industrialists. What is not so common is their ability to generalise about it. In discussion, so many businessmen, and especially accountants, repeat the conventions described by the costing text-books, little realising how important it is that economists should be told about the adjustments that they are constantly making, or being forced to make, in order to meet the market situation.

The London School of Economics.

British Banking Practices, 1750-1850: Some Legal Sidelights

By J. K. HORSEFIELD

The institutional history of British banking has yet to be written, but unfortunately many vital data have disappeared, not least in the blitz. To reconstruct the story now will necessitate piecing together every fragment of evidence that survives. One possible source is the Law Reports, in which are embedded many illuminating references to banking practices. What follows is an attempt to indicate some of the light which the Civil Law Reports can throw on the manner of British banking, roughly from 1750 to 1850.[1]

For this period the *English and Empire Digest* lists something over 250 reports dealing with specific banking problems; and many more in which banks were only incidentally involved (e.g., bankruptcy and bills of exchange cases). Out of this 250, nearly 100 throw some light—though often minimal—on contemporary banking practices. To impose order on this diversity is not easy, but four groups of topics may be distinguished: notes and cheques; banking hours and clearing-house procedure; the relationships between London and country banks; and overdrafts and charges.

I

In the early years of the period notes were, of course, more important than cheques, and much legal time was devoted to deciding two questions which constantly recurred. One was whether a tender of a bank-note was a good (though not a legal) tender; the other, how long a holder might retain a note without risking loss in case the issuer went bankrupt.

The importance of these two questions was rightly stressed. For, as Lord Mansfield said in 1758,[2]

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[1] The appearance of individual banking facilities in the Courts was of course unlikely to be contemporary with their introduction. The dates of the Reports are therefore significant not so much to shew when the practices began as what they were in the years cited.

[2] Miller v. Race; 97 E.R. 398.

> "A bank-note is constantly and universally, both at home and abroad, treated as money, as cash, and paid, and received, as cash; and it is necessary, for the purposes of commerce, that their currency should be established and secured."

To the first question, as to the validity of tender, the Court eventually returned a pragmatic answer. As stated by Buller, J., in 1790, the Court had never yet determined that a tender of banknotes was always a good tender; but where, as in the case before him, no objection was made, they considered it a good tender, "and rightly, for banknotes pass in the world as cash".[1]

The significance of the second question was, of course, that private bankers so frequently went bankrupt. The ensuing problem, as to who was to lose on the outstanding notes, cropped up constantly. I have referred elsewhere to some of the fluctuations of opinion which may be observed.[2] As early as 1749 the Court had suggested that it was established that if a goldsmith's note was taken and kept beyond three days, and the goldsmith broke, it was the holder's own fault for keeping it so long.[3] But the Judge promptly added that there was no Act of Parliament covering the point, and juries continued to differ. And in fact the rule which eventually emerged was considerably more stringent; as stated in 1819, it was that the holder of a note must give notice (of his wish to obtain payment) by the next day's post after he received the note.[4]

It might be thought that the risks of this game of musical chairs were so great that the use of notes would be discouraged. But there is ample evidence to the contrary. The dicta of Lord Mansfield and Mr. Justice Buller, quoted above, can be supported by case after case shewing that quite large notes were accepted by all and sundry. Two examples will suffice. In the suit which Lord Mansfield was hearing, the note was for £21 10s. 0d. (no small sum in 1758) and the holder was an innkeeper. In 1809 a £50 note was changed, by a publican who could neither read nor write, for a customer who bought a brandy and water; he said that he was accustomed to receive notes of equal amount in the course of his business.[1]

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[1] Wright v. Reed; 100 E.R. 729.
[2] *Bankers, Insurance Managers, &c., Magazine*, Vol. CLXVII (1949), p. 221.
[3] Walmsley v. Child; 27 E.R. 1070.
[4] Williams v. Smith; 106 E.R. 447.

On the Continent even larger notes were in circulation. Two cases, one in 1791[2] and one in 1829[3], concerned Bank of England notes for £500, improperly obtained in England, sent to the Continent, and thence returned for encashment. It is true that in the first case it was stated that such large notes did not normally circulate in Middleburgh, whence it was remitted, and the holder was consequently suspected of complicity in the original fraud. But in the second case Tenterden, C. J., said that the Court must not prevent the circulation of Bank of England notes abroad, as that would be inconvenient to merchants and travellers; however, it had become the habit to send stolen large notes abroad, and the precaution must be taken of requiring the remitter to prove that he had given value for the note before it was paid to him.

An exception to the general use of notes was, as has been often pointed out, the County of Lancaster.[4] That this was so as late as 1824, and the reason for it, are both clear from a case decided that year in the King's Bench, where it was explained that[5]

> "the circulation of the town of Lancaster and the county at large was conducted in a great measure by bills . . . paid in, and afterwards paid away by the bankers; and if that had not been done, each bank would have required an immense unemployed capital of [? Bank of England] bank-notes or been obliged to draw upon their correspondents in London, and thereby considerably increase their expense."

The bills thus circulated came to be accepted as customary tender in the same way as notes.[6]

Elsewhere bankers took different views, and sought to circulate their own notes as widely as possible. In one case where this attracted judicial notice, in 1826, Best, C.J., remarked of the clerk who had rashly cashed a stolen Bank of England note for £500 that[1]

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[1] King v. Milsom; 170 E.R. 1062.

[2] Solomons v. Bank of England; 104 E.R. 319.

[3] De la Chaumette v. Bank of England; 109 E.R. 78.

[4] Ashton: "The Bill of Exchange and Private Banks in Lancashire, 1780-1830", *Economic History Review*, 1945, p. 25. See also my "Gibson and Johnson: A forgotten *Cause Célèbre*" in *Economica*, Vol. X (1943), p. 233, and references there cited.

[5] Thompson v. Giles; 107 E.R. 441.

[6] Lockyer v. Jones (1796); 170 E.R. 142n.

> " An excessive anxiety to get his employers' notes into circulation prevented him from using due caution in inquiring respecting a perfect stranger for whom he discounted [*sic*] a much larger bill [*sic*] than in the course of eleven years he had ever before received from any one."

One use for notes was, of course, to send money easily by post. While highwaymen were a menace the notes were usually cut in halves, and the halves sent by separate mails.[2] This practice must have raised the question as to who was entitled to payment if the two halves were presented separately. The practical solution approved by the Courts was that the holder of the first half presented was paid on giving an indemnity. In the case in which this was noted, the owner, suing on half a note of which the other half had been stolen in transit, refused to give an indemnity, claiming that as his half had the signatures on it, he should be paid. But the Court would not require the banker to pay without being indemnified, because the second half might be in the hands of a holder for value, who would have equal rights to payment.[3]

In the latter part of the period the Bank of England bank post bill, payable seven days after sight, was extensively used to avoid loss in this way. However, its practical utility must have been considerably impaired by the fact that it was frequently cashed at sight by Bank of England branches, and indeed by other banks. In one case where the post bill was cashed by a private banker, it was stated that he " took the usual commission ", which may help to explain the readiness with which this was done.[4] Be that as it may, a case over a bank post bill cashed by a Bank of England branch produced the statement that such notes, after once being paid, " frequently circulate about the country as cash for a very considerable period, and . . . have a great circulation."[5]

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[1] Snow and Ors. v. Peacock and Ors.; 130 E.R. 569.

[2] E.g., Mayor and Ors. v. Johnson and Eaton (1813); 170 E.R. 1398. Williams v. Smith (1819), *supra*, p. 309, n.4.

[3] Mayor v. Johnson, *supra*, n.2.

[4] Strange v. Wigney (1830); 130 E.R. 1442.

[5] Willis and Anr. v. Bank of England (1835); 111 E.R. 694. But see *re* Wise and Ors., *ex parte* Atkins (1842), where the Court held that a bank post bill remained the property of a depositor during the seven days' notice. (12 L. J. Bcy. 28.)

But meanwhile the use of cheques was growing, and giving rise to very similar problems. There was the question about the impact of loss in the event of bankruptcy. As early as 1746 a jury found that the holder of a cheque received at noon was negligent in not paying it in on the same day. Defendant in that case pleaded the custom of the City, but Foster, J., said that

> "Bankers had no right to establish a customary law amongst themselves at the expense of other men"

and would not overrule the jury.[1] The City subsequently made a practice of paying in cheques the same day as received,[2] but bankers west of St. Paul's[3] and in the country[4] adopted, with judicial approval, a rule similar to that for notes. When clearing arrangements developed, as discussed in the next section, these rules were modified to accommodate the clearing-house timetable.[5]

Three peculiarities of cheques cropped up in the Courts. The inclusion of the names of the partners on cheque forms, of which the plaintiff had signed many, was held to constitute notice to him of changes in the banking partnership.[6] The custom of the City in the matter of "crossings" received the blessing of the Court in a case in 1828 in which it was elucidated as follows[7]:

> "On behalf of the plaintiff it was claimed that the custom of bankers in London was to pay cheques crossed with the name of a banker only to that banker. But some of the jury said that the custom only extended to making bankers refuse to pay such a cheque to anyone but a banker; it was usual for the holder to substitute another banker's name, or that the words "& Co." were written in the first instance and the particular banker's name filled up afterwards—the object being to trace the cheque, and not to secure payment to a particular party or restrict its circulation."

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[1] Hankey v. Trotman; 96 E.R. 1.

[2] Alexander v. Burchfield (1842); 135 E.R. 431.

[3] Rickford v. Ridge (1810); 170 E.R. 1243.

[4] Moule v. Brown (1838); 132 E.R. 790.

[5] Robson v. Bennett (1810); 127 E.R. 1128. Boddington and Davis v. Schlencker (1833); 110 E.R. 639.

[6] Barfoot v. Goodall (1811); 170 E.R. 1336.

[7] Stewart v. Lee and Ors.; 173 E.R. 1115.

The third problem arose from the provisions of the Stamp Act, 1815,[1] of which the Schedule exempted cheques from stamp duty if they were drawn on bankers residing within ten miles, stated the place of drawing, and were dated on or before issue. Postdated cheques thus attracted stamp duty. Section 13 of the same Act imposed a penalty of £100 for infringement and precluded any banker who knowingly encashed a cheque which did not meet these conditions from claiming repayment on it. Litigation naturally followed.[2]

The use of cheques also led naturally to the evolution of the pass-book. The first reference I have seen is to 1810, when the system prevailing was described as follows[3]:

> " A book, called a *passage-book*, is opened by the bankers, and delivered by them to the customer." All transactions were posted therein. Town customers kept the book and handed it in from time to time to be made up. Silence as to entries was acceptance of their correctness. Country customers received accounts from time to time in the same form as the passage-book.

By 1823 the name had altered to " pass-book ".[4]

II

Banking hours were stated in 1806[5] to be a matter depending altogether on the personal convenience of different bankers, " those in the City keeping their houses open for payments until five o'clock, and those at the West End of the town till six in the evening ". But the closing hour was not as rigid as it now is, for in 1843 the practice of the City banks was said to be to draw a line in the counter-book at five o'clock and thereafter pay no cheques, but to accept any money deposited and place it separately for attention next day. In some firms these deposits were entered below the line, and in others not entered at all until the next morning.[6] In the country, however, hours may have been shorter; in 1826, in Totnes, they were from 10 to 4.[1] Probably the time of departure of the mails was important in deciding when to close. In any case, other variations in the day's routine were not unusual, as witness the adventure of a clerk in 1848.[2] The National Provincial Bank of England's Bideford branch sent a clerk on horseback 11 miles to a farm near Membury, to receive money for lodgment, at the request of the depositor. For this service 7s. 0d. was charged. The clerk had dinner at the farm and started back with £447 1s. 0d. (of which £120 was in gold) in a canvas bag in his pocket. *En route* his coat gave way, and the money was never found. Evidence was tendered that

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[1] 55 Geo. III, c. 184.

[2] Martin v. Morgan (1819); 129 E.R. 734. Swan v. Bank of Scotland (1835); 6 E.R. 231, 1566.

[3] Devaynes v. Noble (1816); 35 E.R. 767, arising out of the bankruptcy of Devaynes, Dawes, Noble & Co. in July 1810. This is a clear instance where the introduction of a banking facility considerably ante-dated its discussion in the Courts; Ashton, *loc. cit.*, quotes from pass-books in use in 1791.

[4] Price v. Marsh; 171 E.R. 1102.

[5] Parker v. Gordon; 103 E.R. 149.

[6] Sadler v. Belcher; 174 E.R. 359.

> "such a transaction was out of the ordinary course of banking business, as conducted in the West of England; but . . . in London, it was customary for bankers to send about, in all directions, for their customers' moneys".

By 1808 the practice of the City revolved around the procedure of the Clearing House, which was thus described in that year: (The plaintiff had paid into Vere and Co., his bankers, a cheque on Glynn's)[3]

> "Vere's clerk took it to the clearing house to be paid, and put it into defendants' [Glynn's] drawer. Each banker has a drawer there for that purpose. The time for putting in the cheques, is from three to four. . . . The course was proved to be, for the clerks to take the cheques from the drawers and send them to the respective bankers; those which they will not pay, they send back before five. They are sometimes cancelled when they come in; but, by the custom, they may be returned any time before five o'clock"[4]

What happened to cheques received after four o'clock was described two years later[5]:

> "By the practice of the London bankers, if one banker who holds a cheque drawn on another banker presents it after four o'clock, it is not then paid, but a mark is put upon it, to shew that the drawer has assets, and

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[1] Gillard v. Wise; 108 E.R. 49.

[2] Melville v. Dodge; 136 E.R. 1324.

[3] Fernandey v. Glynn; 170 E.R. 1009n.

[4] Altered later to 4.57 p.m. [Warwick v. Rogers (1843); 134 E.R. 595.]

[5] Robson and Waugh v. Bennett and Anr.; (1810); 127 E.R. 1128 (headnote).

> that it will be paid; and cheques so marked have a priority, and are exchanged or paid next day at noon, at the clearing house".

In the same case it was found as a fact that "the custom of the trade amongst bankers" was to pay all cheques at the clearing house, and not at their own premises.

Country clearings appear to have evolved more slowly; they were of course much dependent on the times of the mails. One case, in 1823, concerned two Maidstone banks, which exchanged cheques daily and notes once or twice a week.[1] A more complicated, though limited, mechanism was explained in 1826. The banks involved were the Dartmouth General Bank, the Dartmouth Bank, the Totness Bank, the Totness General Bank, the Newton Bank, and an unnamed bank at Brixham. Each day the Totness Bank collected into a parcel any notes which it had of the Dartmouth General Bank, the Dartmouth Bank and the bank at Brixham, and sent them, by the postman, to the Dartmouth General Bank. Each day the Dartmouth General Bank similarly despatched to the Totness Bank any notes of the Totness Bank, the Totness General Bank, and the Newton Bank. The postman left Totnes for Dartmouth at 5 a.m., and Dartmouth for Totnes at 6 p.m. If the Dartmouth General Bank found a balance for the day (including the morning parcel from Totnes) in favour of the Totness Bank, they instructed their London agents to pay it to the Totness Bank's London agents. If the Dartmouth General Bank similarly found a balance in their own favour, the Totness Bank would settle it next day either in notes or by a corresponding order on London.[2]

No doubt it was the habit of co-operation, fostered by Clearing Houses, which assisted in the formation of the "Bankers' Society for Protection Against Forgers" which was mentioned in a case in 1829.[3]

III

It will have been noticed that drafts on London were used to settle balances in country clearings. This was, of course, only one of the functions performed by London banks for their country correspondents. A large number of cases in the period are concerned with one or other of the complex relationships which developed between London and the provinces.

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[1] Edmeads and Ors. v. Newman; 107 E.R. 155.

[2] Gillard v. Wise; *supra*, p. 314, n.1.

[3] Cocks v. Masterman; 109 E.R. 335.

One service which was early established was for London banks to accept bills drawn on them by their country correspondents. The latter were not necessarily bankers, as is evidenced by a case in 1777 where a provincial merchant employed one Jenner as his "agent or banker" in London, drawing bills on him and remitting other bills to cover the account.[1] There developed an interesting difference in practice between London and provincial banks in their treatment of bills received, before their due date, for customers' credit. As described in 1807, the procedure was as follows[2]:

> Bankers in London, upon the receipt of undue bills from a customer, do not carry the amount directly to his credit, but enter them short, as it is called; that is, note down the receipt of the bills in his account, with the amount, and the time when due, in a previous (or inner) column of the same page; which sums when received are carried forward into the usual cash column.
>
> But in the country, if the bills have not long to run, they enter them in a gross sum with cash to the credit of the customer, giving him either cash or liberty to draw. Such bills are therefore regarded by country banks as their property.

Generally speaking, the London bank had the right to discount bills in its hands to replenish the country bank's account. This was not necessarily done; in a case in 1796 the London bank chose instead to charge interest on the overdraft.[3] But neither was the power to discount universally given. In a case in 1812 involving Boldero and Co., London, which failed while acting as London agent for, *inter alia*, the Hull Bank, the Wakefield Bank, the York Bank, the Yeovil Bank, and the Leeds and Thirsk Bank, the last four had allowed Boldero's to discount bills which they had transmitted, to the extent necessary to keep them in credit, but the Hull Bank had refused to permit this.[4]

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[1] Zinck v. Walker and Ors., assignees of Jenner; 96 E.R. 681. See also "Gibson and Johnson . . ." (*supra*, p. 310, n.4).

[2] Giles v. Perkins; 103 E.R. 477.

[3] *Ex parte* Maddison; cited 34 E.R. 435.

[4] *Re* Boldero, *ex parte* Pease, etc.; 34 E.R. 428.

It should be noted that the London bank accepted no responsibility towards the country bank's customers. In 1794 a London bank was upheld by Lord Kenyon in refusing to compensate a country correspondent for loss sustained through a worthless cheque obtained for him from another London banker in discount of bills.[1] And in 1849 the Court was told that it was[2]

> "the custom and course of business that there was no accountability between London bankers and the customers of their country correspondents; all monies received to the use of country correspondents were paid to or placed to the credit of the country banker."

So if the country bank failed, the London bank was not responsible to its customers. Moreover, any sum deposited in a London bank for the credit of a customer of the country bank became at once the property of the latter bank, and thus irrecoverable even if that bank went bankrupt while the remittance was in transit.[3]

On the other hand, the London banks may have tended to ask for collateral. At any rate, it transpired in 1823 that a Huddersfield bank had given Bruce, Simson, Stephenson and Freen, their London agents, a penal bond for £20,000 to cover their potential obligations.[4] This development may well have arisen from the custom by which the London bank undertook to pay on demand the notes of their country correspondents.[5] However, there was sometimes a reciprocal arrangement, as when Glyn's, in London, accepted £650 from a coach-proprietor—not a customer of theirs—on the understanding that the amount would be paid out to him again by their correspondents at Northampton, where he was going to buy horses.[6]

A somewhat surprising feature of the recorded cases is the high proportion in which the London bank had the same partners, or some of them, as the country one. For instance, Caldwell, Smith, Forbes and Gregory, bankers of Liverpool, failed in 1793 as a result of the failure of Forbes and Gregory, merchants, who were their London agents.[1] In another case, one Beachcroft, from 1811 until he died in 1813, was a partner both in Bosanquet's, in London, and in Beachcroft and Wray, bankers, Barton, Lancs.[2] In 1816, Messrs. Wetherell, Stokes, Mowbray, Hollingsworth and Co. were bankers both in London and, under the style of the Durham Bank, in Durham.[3] So the well known Jones, Loyd & Co., London, operated also in Manchester as William Jones, Samuel Jones Loyd, Edward Loyd and Co.[4] Obviously if one bank failed the other was apt to fail too. Even where this did not happen, the consequences frequently were that the London bank became extremely solicitous at signs of weakness in its provincial connections. A dramatic example was described in the Courts in 1817.[5]

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[1] Russell v. Hankey; 101 E.R. 409.

[2] Adams v. Peters; 175 E.R. 302.

[3] Williams v. Deacon (1849); 154 E.R. 1267.

[4] Simson v. Ingham; 107 E.R. 307.

[5] Owenson v. Morse (1796); 101 E.R. 856. Mayor v. Johnson (1813), *supra*, p. 311, n.2. Beaching v. Gowet (1816); 171 E.R. 253.

[6] Shillabeer v. Glyn (Bart.) and Ors.; (1836); 150 E.R. 704.

> Messrs. Wilkinson, Snowden and Lumley, bankers at Stockton and Sunderland, had agents also at Newcastle-on-Tyne and Stokesley. Their London agents were Messrs. Sikes, Watson, Sikes, Wilkinson and Snaith, with whom they had lodged securities as a guarantee that their account would always be kept covered.
>
> At 8 o'clock in the morning of Saturday, July 22, 1815, Watson arrived unexpectedly at Stockton, by the mail from London, which he had left on the Thursday evening. He said that " from the recent failures in the north, his house in London, supposing that their house would want some assistance, had thought it best that he should come down to render what assistance he could ". He enquired about liabilities, and was told that Wilkinson, Snowden and Lumley held about £20,000 in deposits, and an equal amount in notes were circulating; that, he said, was " a mere nothing ". However, the amount of notes was subsequently corrected to £40,000, which Watson said would " make a material alteration ".
>
> Wilkinson, as head of the northern bank, gave Watson some miscellaneous securities, to reduce their debt to the London firm, plus various notes and bills which he understood Watson would convert into Bank of England notes and send them. Watson then returned to London to consult his partners.

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[1] Bent v. Puller (1794); 101 E.R. 278. Also Bolton v. Puller (1796); 126 E.R. 1053.

[2] Bosanquet v. Wray (1815); 128 E.R. 1167.

[3] Leadbitter v. Farrow; 105 E.R. 1077.

[4] Lloyd [sic] v. Heathcote (1833); 2 L. J. Ex. 162.

[5] Simpson v. Sikes; 105 E.R. 1253.

> In the event, the London firm appropriated all that Watson had collected (except some bills, which were not met) to reduce Wilkinson, Snowden and Lumley's debt to them. The latter immediately closed; they admitted that they had been insolvent for a long time.

IV

As to the nature of the accommodation given by bankers to customers, discounts were the most common form of transaction mentioned. But advances were quite frequent, and while it is not always clear whether loans or overdrafts were involved, the latter appear a number of times. One case, in 1777, has been cited above.[1] Between 1778 and 1789, an advance of £1,000, made by Moorhouse and Co., bankers, to a solicitor named Vanderzee, increased to £1,541, although the security lodged remained at £1,000.[2] A similar case, involving an eventual unsecured overdraft exceeding £25,000, came before the Courts in 1809.[3] Other references to overdrafts occur in 1821 (a Newmarket bank),[4] 1828 (Liverpool),[5] 1834 (Sandwich),[6] 1836 (London),[7] 1836 (Norwich),[8] and 1837 (Northern and Central Bank, branch not stated),[9] The last three cases all involved joint-stock banks. I have seen only one case (in 1812) where it was stated that overdrafts were not given; this concerned the London firm then called Birch and Chambers.[10]

While little emerges about the normal duration of advances, they seem sometimes to have been kept open for years. The case heard in 1809, mentioned in the last paragraph, involved a loan which ran, for varying but always large sums, from 1780 to 1803. One decided in 1822 arose out of a loan for £1,000 renewed on a fresh promissory note every three months for "9 or 10 years".[11] A call money loan as such is not mentioned; perhaps the nearest approach to one formed part of the arrangements made in 1824 between Gomersall, Gandell & Co., bill-brokers, and their bankers,

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[1] Zinck v. Walker, *supra*, p. 316, n.1.
[2] Vanderzee v. Willis (1789); 29 E.R. 385.
[3] Boldero v. Jackson; 103 E.R. 1143.
[4] Eaton v. Bell; 106 E.R. 1106.
[5] Heywood v. Watson; 130 E.R. 859.
[6] Boyd v. Emmerson; 111 E.R. 71.
[7] Ryder v. Willett; 173 E.R. 267.
[8] *Re* Brereton, *ex parte* Bignold; 6 L.J. Bcy. 17.
[9] Thorpe v. Jackson; 160 E.R. 515.
[10] R. v. George Hammon; 168 E.R. 771.
[11] Rogerson v. Ladbroke; 130 E.R. 39.

Vere, Sapte & Co. The former borrowed £20,000, in respect of which they agreed (*a*) to leave £10,000 bills with the bank; (*b*) to provide a second £10,000 which Gomersall, Gandell would hold during the day and Vere, Sapte overnight; (*c*) to keep £4,000 on deposit. (If (*b*) diminished, (*c*) had to be increased, and *vice versa*.)[1]

The final point on which light is shed by these Reports is the rate of interest. In most cases the maximum legal rate (5 per cent.) was charged for accommodation, and such litigation as arose was concerned to determine what commissions might also be charged without infringing the Usury Acts. In 1786 it was decided that a Sudbury bank might charge 5s. 0d. per cent. for its trouble in discounting bills in London for its customers.[2] The same commission was allowed in 1790 to a London banker for arranging discounts for a Manchester firm, even though it transpired that the bills were actually signed in London and handed over to the bank there.[3] In 1810 a Faversham bank was allowed 2s. 6d. per cent. per month (which, if the average bill was a 3 months' one, meant 7s. 6d. per cent. per transaction).[4] And by 1815 a jury was prepared to allow 10s. 0d. per cent. on a transaction.[5]

A judicial quirk prevented bankers for a time from charging compound interest, Lord Ellenborough declaring that simple interest alone was allowable (1810)[6] unless it could be shewn that the defendant knew, as was alleged in a later case, that to calculate interest "upon half-yearly rests" was "according to the universal practice of the house",[7] or unless this had been specially agreed (1821).[8]

On deposits, the eighteenth century bankers seem normally to have allowed 4 per cent,[9] but after the turn of the century lower rates are encountered for short-term deposits—3 per cent. in 1813, reduced to 2½ per cent. in 1824, for deposits at ten days' notice,[10] and 2½ per cent. at 14 days' notice in 1837.[11] By 1833 it was being stated by the Court that deposits did not normally attract interest unless this was specially agreed.[1]

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[1] *Re* Bentley, *ex parte* Vere (1835); 4 L.J. Bcy. 34.
[2] Winch v. Fenn; 100 E.R. 30n.
[3] Curtis v. Livesey; cited 105 E.R. 807.
[4] *Ex parte* Jones; 34 E.R. 128.
[5] Carstairs v. Stein; 105 E.R. 805.
[6] Dawes v. Pinner; 170 E.R. 1227n.
[7] Moore v. Voughton; 171 E.R. 538.
[8] Eaton v. Bell; *supra*, p. 319, n.4.
[9] Jacomb v. Harwood (1751); 28 E.R. 172. Ikin v. Bradley (1818); 146 E.R. 687.
[10] Sutton v. Toomer (1827); 107 E.R. 778.
[11] Wheatley v. Purr; 48 E.R. 419.

It was left to the joint-stock banks to introduce a more flexible arrangement. Prior to 1837 the London agents of the Commercial Bank, Kingston, Upper Canada, were T. Wilson & Co., who charged 10s. 0d. per cent. commission on all transactions and 4 per cent. interest on overdrafts, themselves allowing 4 per cent. on any credit balance. The London Joint Stock Bank then secured the business on the following terms: Commission, 10s. 0d. per cent. Interest charged to be 1 per cent. more than interest allowed, but both rates to fluctuate with market rates. " For the present [May, 1837] while money is so scarce " they would charge 5 per cent. and allow 4 per cent., but " should money decrease in value " they would charge 4 per cent. and allow 3 per cent., or charge 3 per cent. and allow 2 per cent.[2] Since the Canadian bank accepted these terms it was presumably more accustomed to being in debit than in credit to London, and also optimistic about the future level of interest rates. Unfortunately for both banks, the whole scheme was disallowed as an infringement of the charter of the Bank of England.

In putting together these notes I have been constantly tempted to adduce confirmatory or contradictory references from other contemporary sources, such as the Parliamentary Reports. But to do so would have been to expand a sketch into a volume. It has seemed better to keep rigorously to the Law Reports, even at the expense of producing only isolated examples, and thus precluding a proper weighing of the evidence. What was stated in the Courts may offer hints for enquiry; that is the modest hope of this essay. Proof must await the study, not of the odd case, but of long-period records.

London.

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[1] Edwards v. Vere; 110 E.R. 795.

[2] Booth v. Bank of England (1840); 7 E.R. 1163.

Multiple-Purpose Public Enterprises—Criteria for Pricing[1]

By ALAN S. MANNE

INTRODUCTION

During the years since Hotelling rediscovered Dupuit's welfare theorems,[2] critics have pointed out numerous qualifications to any literal interpretation of the marginal-cost rule. Of these, perhaps the most controversial has been the " recoupment of full costs ". On fiscal grounds, opponents of the rule have made out a convincing case in favor of the alternative standard—" full-cost " pricing.

Granted that the full-cost standard may be an adequate guide in the case of single-product public monopolies, nevertheless it can only lead to confusion where two or more distinct products are involved, e.g., a Tennessee Valley Authority, a railroad network, or a countrywide telephone system. In all of these cases, arbitrary conventions could easily interfere with the optimum use of resources.[3]

A number of special solutions to the problem have previously been advanced, but their limitations are not appreciated widely. One of the most famous of these is the formula employed by T.V.A.—the " alternative justifiable expenditure " method. In brief, this consists of allocating common costs among the various " products " in proportion to the minimum costs required to provide each of them in isolation. (This gives a rough approximation to a " benefits received " standard.) It would guarantee an " ideal " output of each product only in a case where the enterprise was confronted with demand curves, all of which were perfectly inelastic. In any other situation, it would be possible to expand the output of certain products, and to recover a greater proportion of the common costs from those where demand is inelastic.

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[1] I should like to record my indebtedness to Professor Carl Kaysen and to the members of the Taussig Society for their stimulating criticisms and suggestions in the preliminary stages of this paper.

[2] Harold Hotelling, " The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates ", *Econometrica*, Vol. VI, No. 3, July, 1938, pp. 242–269.

[3] Norris and Crosland both exhort us to have faith in " standard costing " techniques, yet do not indicate any of the principles that underlie such methods: Harry Norris, " State Enterprise Price and Output Policy and the Problem of Cost Imputation ", *Economica*, N.S., Vol. XIV, No. 53, February, 1947, p. 62; C. A. R. Crosland, " Prices and Costs in Nationalised Undertakings ", *Oxford Economic Papers*, Vol. II, No. 1, January, 1950, p. 63.

Similarly there is a special assumption implicit in the proposal that prices of individual products be set *proportional* to their marginal costs. In this way, of course, full costs could be recovered, and users could set their marginal rates of product substitution equal to the marginal rates of product transformation for the enterprise.[1] Unfortunately, this criterion is useful only under important restrictions: first, the products must be close substitutes for one another; second and more significant, none of them must be close substitutes for any commodity produced *outside* the firm. This method of pricing does nothing to ensure an optimum rate of consumers' substitution between the products of different firms.

Outline of a more General Solution

There exists then a variety of full-cost standards which —although arbitrary in general—may be useful under particular conditions of demand. Both for reasons of public policy and for esthetic ones, it would be desirable to have a set of pricing rules that are applicable over a wider range of conditions. I would propose that this be treated as a maximum problem *subject to a restraint*, and that it be explicitly recognised that such a restraint does diminish the attainable net social product.

There are many facets to the argument, but so far as possible I shall avoid compounding the difficulties. The following assumptions will be made: (1) There is no distinction between the long-run and the short-run cost functions. All factors of production are instantaneously variable. (2) The total cost function for the enterprise has been ascertained, is known accurately, and reflects all social costs. (3) This cost function is at least twice differentiable. (4) For each product, there is a unique demand curve confronting the enterprise. All oligopolistic interdependence is excluded. (5) Consumers' surplus—the integral of the area under the market demand curve—is a satisfactory index to the welfare of consumers. The " net social product " is defined as the excess of all consumers' surpluses over the social costs of the enterprise. (6) Price discrimination is not feasible—either for reasons of equity or of administrative difficulty.

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[1] See, for example, J. A. Nordin, " The Marginal Cost Controversy: A Reply ", *Economica*, N.S., Vol. XIV, No. 54, May, 1947, esp. pp. 139–41.

Consider now a public enterprise producing $x_1, x_2, \ldots x_n$. Its total costs, C, are given by the following relation :

$$(1) \qquad C = C(x_1, x_2, \ldots x_n)$$

(The partial derivative of C with respect to x_i along this function is denoted by C_i.)

Where p_i is the price of commodity i, the demand curve for i is given by :

$$(2) \qquad p_i = p_i(x_i) \qquad (i = 1, 2, \ldots n)$$

(The total derivatives along these functions are indicated by p'_i.)

B_i, the benefit derived by consumers of commodity i, is measured by the consumers' surplus :

$$(3) \qquad B_i = \int_0^{x_i} p_i(x_i)dx_i - x_i \cdot p_i(x_i)$$

$S.P.$, the net social product of the enterprise, is defined as the excess of social benefits over social costs. (Note that the $x_i \cdot p_i(x_i)$ term from (3) vanishes. That is, the cash charges levied against consumers are identical with the receipts of the public enterprise, and leave the net social product unchanged.)

$$(4) \qquad S.P. = \sum_{i=1}^{n} \int_0^{x_i} p_i(x_1)\, dx_i - C$$

In the case where the public enterprise is permitted to run at a loss, the problem is one of selecting $x_1, x_2, \ldots x_n$ in such a way as to maximise $S.P.$. Necessary conditions for this maximum are :

$$(5) \qquad p_i(x_i) - C_i = 0 \qquad (i = 1, 2, \ldots n)$$

This is simply the familiar justification for the marginal-cost rule. But where the enterprise is enjoined to incur no losses, we have an additional constraint upon the maximum :

$$(6) \qquad \sum_{i=1}^{n} x_i \cdot p_i(x_i) - C = 0$$

Equation (6) may also be written as an implicit function :

$$(7) \qquad F(x_1, x_2, \ldots x_n) = 0$$

(F_i denotes the partial derivative with respect to x_i along this function.)

From (6) we have :

$$(8) \qquad F_i = x_i \cdot p'_i + p_i - C_i$$

In short, the object is to maximise (4) subject to the restraint (6). Because of this restraint, we are free to vary only n-1 of the x_i—and not all n of them. As soon as the n-1 values have been set, the nth is no longer free, but is determined by rule (6). Necessary conditions for the maximum under this restraint are then[1]:

$$(9) \qquad p_i - C_i + (p_n - C_n)\left(\frac{-F_i}{F_n}\right) = 0 \qquad (i = 1, 2, \ldots n\text{-}1)$$

These n-1 conditions may also be written in the following form :

$$(10) \qquad p_i = C_i + (p_n - C_n)\left(\frac{C_i - x_i \cdot p'_i) - p_i)}{C_n - x_n \cdot p'_n - p_n}\right) \qquad (i = 1, 2, \ldots n\text{-}1)$$

That is, the optimum price will exceed the marginal cost of each product by an amount which depends upon three terms all of which must be positive. The first of these, $(p_n - C_n)$, is simply the excess of price over marginal cost for the nth commodity. The other two are each of similar form—the excess of marginal cost over marginal revenue—for the ith and the nth commodity. Another way to look at this set of conditions would be to say that the optimum price of each commodity exceeds its marginal cost by an amount proportional to the excess of its marginal cost over marginal revenue.

Conclusions

To the extent that these revenue considerations cause a departure from the strict Hotelling-Lerner rule, of course there is a welfare loss—just as in the classical examples of the private monopoly or the excise tax. In principle, all such losses in social welfare could be avoided by discriminatory pricing. My only justification for inquiring into a one-part price is the conviction that the alternative would

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[1] Note that there is nothing peculiar about the nth commodity in this system. Commodities 1, 2, . . . or n–1 could just as well have been selected for this operation. The resulting prices and quantities would remain unchanged. The symmetry of this treatment is more obvious if we write equation (9) as :

$$(9a) \qquad \frac{p_1 - C_1}{F_1} = \frac{p_2 - C_2}{F_2} = \ldots = \frac{p_n - C_n}{F_n}$$

generally require the enterprise to strike a separate bargain with each individual consumer.

Only the most naive will suppose that a rule such as (10) is an open sesame to all problems in welfare economics. The most serious limitation, in my opinion, is the use of consumers' surplus rather than the Bergson-Samuelson social welfare function. It is all too easy to conceive of problems where consumers' surplus *might* be invalid, and where interpersonal comparisons would be relevant. If in a particular case the distributive considerations are significant, a solution in terms of consumers' surplus might nevertheless be a worth-while point of departure for further adjustments.

Perhaps the most interesting thing about a " constrained optimum " rule is the fact that it gives sanction to practices that are already understood at an intuitive level. It provides justification for charging a price well above marginal cost on products where demand is relatively inelastic, while at the same time permitting a price nearer to marginal cost on other products. Some welfare loss is inevitable in any departure from the strict marginal-cost rule, but it is important to realise that the magnitude of these losses is directly related to the elasticity of the demand curves.

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Book Reviews

Five Lectures on Economic Problems. By G. J. Stigler. Longmans Green & Co. Ltd. 1949. 65 pp. 7s. 6d.

This volume contains five public lectures delivered at the University of London. They read like stimulating and interesting lectures and for their audience they must have been a welcome change from some of the more forbidding series which have been delivered under the same auspices. Yet precisely because of their virtues as lectures they seem a trifle insubstantial in book form. Professor Stigler has not attempted a single theme, but has touched on three : the virtues of the classical economists (that is, the writers up to Mill and Senior), monopolistic competition and the mathematical method in economics. On each of these he has something interesting to say ; on each I feel his opinions to be subject to serious doubt.

On the problem of equality, Stigler makes clear that the English classical economists were aware, as all men with philosophical interests must be, of the futility of riches. The poor man in his cottage may well be happier than the rich man in his castle. But, like almost everybody else, whether with philosophic interests or not, they did not draw any practical conclusions from this fact. Wealth does not bring happiness, contentment or any of the ends which people might reasonably be expected to seek. Yet few reject it as an important element of their ambitions. Eastern societies are often supposed immune from the urges of the acquisitive society, yet as they become aware of higher income levels available in other countries they clamour to share them. A few ascetics apart, those who denounce the senselessness of the pursuit of wealth are most eager to emphasise the importance of its equitable division. For the classicists the virtues of the growing commercial society seemed to be, that untrammelled by government pressures wealth or the gross product of society could be maximised. To what end ? Despite Stigler's quotations from Smith and Senior, these writers did not normally feel it necessary to worry about the answer. When they did, the answer would be overwhelmingly in terms of liberty. Freedom is the greatest good and if people have freedom they will seek wealth and they should not be hampered in their achievement. As man is the best judge of his own interest he must be left to seek the ends he proposes to himself. Except perhaps to an economist this must seem grossly oversimplified. Freedom cannot mean the right to choose anything ; it can only mean the right to choose between the alternatives which ought to be available. This formulation is dangerous, for it can justify any arbitrary act, yet it is difficult to be more precise. It turns on what choices ought to be available, but it is difficult to say more than that they should be those which, we conceive, are compatible with the good society. For the classical writers, a society of people striving to acquire wealth by ingenuity and sobriety, by unremitting toil and skill in forecasting the future, seemed a good society. They were writing at a time and from a class where these were virtues to be contrasted with the vices of ostentation of the landlord and shiftlessness of the beneficiaries of the poor law.

Today, equality is more frequently emphasised as a goal which can in fact be approached rather than as a desirable but unattainable end. Stigler emphasises that the justification for this is " that everyone wants more equality " (p. 6). The argument based on the maximisation of aggregate utility is indeed a red herring; it can prove the point only if we have already assumed the answer. I would agree that it is foolish to demand equality simply to raise the propensity to consume ; it is far from proved that we should want to raise the proportion of income consumed, if we do there are plenty of alternative ways, and we cannot even be sure that equality would be effective in achieving this end.

It is not true that everyone wants more equality ; those who have or who hope to have more than the average share do not want equality, whereas those who have no hope of attaining the average income of their community are, or readily become, equalitarians. We do talk about equality more than our predecessors, but the reason we do so is that the distribution of political power has shifted, so that those who are natural equalitarians are acquiring greater power to enforce their desires. This has the consequence foreseen by those who feared the conversion of a parliamentary government dependent on the votes of those citizens " with a stake in the country " into mass democracy. But it must be made clear what is the equality we seek. If it is the equality based on the supreme importance of a rising standard of life—of having more of the things that can be bought on the market—then equality is faced with the dilemma that, in many important cases, greater equality will lead to smaller average shares. On this level, there is indeed " a political wisdom in maximum output that there is not in greater equality " (p. 10). Where this is so, the closer we come to equality the greater becomes the resentment of those who have more than their fair share, and hence the greater the pressure to come even closer ; yet every step that is taken weakens the incentive to maintaining material progress. If we really believe that riches do not bring happiness, then the aim of equality is to change the objects of ambition and endeavour. Then equality is sought because real income is unimportant and not because it is supremely important. Then moderate variations of income are acceptable.

My objection to Professor Stigler is not that he rates the goal of maximum output very high, nor that he treats this as an unambiguous goal. It is that, after quoting the classical writers on the sterility of material wealth, he is no more ready than these writers were themselves to believe that they may have been right. Yet, this possibility that they, together with the fables of our childhood and the teaching of our philosophers, may have made sense, is of major importance in any treatment of equality.

The third lecture returns to the classical economists. The famous report on the Hand-Loom Weavers in 1841 is examined in detail to derive the conclusion that Senior was sensible in analysing a concrete problem and that the analysis would not have been greatly improved had it been done today. It is true, though Stigler does not mention the fact, that the recommendations would be very different. The writer implies that the adequacy of the analysis is surprising. Why? The reader of Smith or Ricardo would have no doubt that they would produce an acceptable interpretation of the problem. Stigler suggests (p. 26) that the classical economists used a better analysis for interpreting concrete problems than the one they set forth in their treatises. The emphasis is misplaced; the treatises are not at fault; but they were chiefly concerned with problems which our treatises do not attempt—in particular, with the economic development of societies. In this they were not very successful, though it is easy to exaggerate the degree of their failure. On the theory of relative prices their theory is broadly consistent with modern theories though in some ways it is less general. The main lesson to be derived from this report is the change of view as to what is practicable and what is desirable.

The second theme, to which two lectures are devoted, is that of imperfect competition. After a brief examination of the work of Professor Chamberlin and Mr. Triffin, Stigler concludes that the attempt to build up a theory which shall encompass the diversity of firms has proved a failure. "Chamberlin's picture of reality has finally led, when consistently followed, to the familiar reaction: *ad hoc* empiricism". Stigler is right in emphasising that the criterion of an adequate theory is that it shall lead to interesting and reliable predictions and that, if this is achieved, we need not be unduly worried by deviations between the assumptions made and reality. In an extreme form this view can soon prove unacceptable, but to reject it entirely implies the rejection of all theory. But is Stigler right in believing that the analysis of the concrete problems of some industry where monopolistic competition prevails can be solved by a judicious admixture of competitive and monopoly theory? The answer is a question of fact; will this procedure give reliable answers to concrete questions? My inclination is to believe that there are many interesting questions for which we do require a theory which is neither that of competition nor of monopoly. Much of this requires a theory of open oligopoly: what happens if seller 'A' is confronted with a handful of close rivals, 'B', 'C', 'D', and each of these firms has as close rivals the first seller and some further firms which are not close rivals to 'A'? Over a wide field of activity, including most retailing, this is a typical situation and I am convinced that its results, in important respects, are substantially different from those of perfect competition and of monopoly. Its elucidation will owe a great deal to Chamberlin, and if this is so we cannot treat the analysis of imperfect competition as a failure.

On the statistical level, Stigler analyses the extent of competition in the United States and concludes " that competitive industries were producing seven-tenths of the national income in 1939, and utilising more than four-fifths of the labour force " (p. 50). This is an interesting conclusion ; the problem is to discover what it means. " A competitive situation is characterised by price or product competition of the individual firms, leading to approximate equality of price and marginal cost in the long run " (p. 48). This does not help ; the addition of the phrase " the long run " prevents us from knowing whether this criterion is, or is not, fulfilled. In fact, the selection of competitive industries is made by choosing the industries where there is not too much concentration of output in the hands of a few firms so as to suggest that abnormal profits will not be made over a long period. On this basis the figures may well be reasonable or even giving too large a share to monopoly. It should be noted that over half the competitive sector is constituted by trade, real estate and services, while for mining, manufactures, transport and communications the preparations of monopoly and competition are about equal. Stigler's choice of criterion is related to his theoretical bias : monopoly and competition, both defined broadly, are the categories we need concern ourselves with and intermediate forms are of no real interest. Before we draw conclusions from Stigler's figures we should do well to make sure that they are not.

Finally, there is one lecture on the use of mathematics in economics. Of this lecture it must suffice to say that it is no less admirably expressed and no less controversial than its fellows.

ALEXANDER M. HENDERSON.

What Happens during Business Cycles: a Progress Report. By WESLEY C. MITCHELL. National Bureau of Economic Research, New York. 1951. xxxi + 386 pp. $5.00.

What Happens During Business Cycles was Professor Mitchell's last work. It remained incomplete at the time of his death. Professor A. F. Burns tells us in his introduction that Mitchell planned a work in seven parts " to develop a model of business cycles from carefully screened observations, to use it in explaining how the cycles of experience are typically propagated, and then press on to account for the outstanding differences between them " (x). The first part, setting out in general terms the aims and the methods employed by the National Bureau in analysing cycles, was completed. So was the second part, which emphasises and illustrates the great diversity of cyclical fluctuations. Of the third part, however, there is only a fraction ; and of the others nothing.

Even this truncated work is sufficient to leave us in no doubt over the loss that Economics has suffered. Professor Mitchell's aim in this book, as in his other writings, was to stress the uniformity and yet the variety of business cycles. The uniformity enables us to pick out certain salient features and to formulate a theory of the cycle. It is on the other hand the variety that must warn us against attaching fixed coefficients to our variables. By and large, trade cycle theory today follows Professor Mitchell in allowing for variety in the timing of economic series. More perhaps could be done to make room for " a more fundamental form of variability—that found from cycle to cycle *within* series " (185).

Some points are open to criticism. Little is done to allay the doubts that have been expressed about the National Bureau's methods of picking out cycles.

The second criticism is one that has been previously levelled at the National Bureau's publications. What should be the rôles of theory and of empirical research ? Professor Mitchell refers to this problem from time to time. It is well to emphasise that " if the aim of economic theory is to attain understanding of economic experience, any summary of the cyclical consensus is a basic contribution to the theory of business cycles " (253). Some theoretical foundation is, however, necessary as a guide in the selection of material ; and this too Professor Mitchell recognises. " To us, the existing explanations were guides to research, not objects of research, and all the more useful because they pointed in so many directions " (5). Our complaint therefore is not that Mitchell neglected theory. That would be unjust. It is that he failed to make his theory sufficiently explicit. Further, one may query the wisdom of postponing for so long the drawing of conclusions. For instance, is he fully justified when on p. 287 he lists some of the many questions suggested by his data and postpones the attempt to answer them ? Any conclusions he might have drawn would have been provisional. But would they not have helped in pointing more explicitly to the data still required and to the type of research needed to find these data ?

It is possible to question some of Professor Mitchell's methods and conclusions. But the blemishes, if indeed they are such, are insignificant beside his achievement. This book is a worthy close to a distinguished list of publications that have contributed so enormously to our understanding of economic problems.

A. D. KNOX.

International Economic Papers, No. 1. Translations prepared for the International Economic Association. Macmillan & Co. Ltd. 1951. 244 pp. 15s.

The International Economic Association is to publish annually a volume of English translations of important economic articles written in foreign languages. The first issue contains an interesting collection of articles, written mainly during the last decade, in French, Dutch, German, Danish, Italian and Russian.

Selection for such a purpose as this is clearly a rather difficult task. The articles chosen range widely. Professor Frisch's article introducing the concept of conjectural variations into the treatment of polypoly, which was written as long ago as 1933, is of considerable historic interest. There is a long article by v. Stackelberg on the theory of foreign exchanges under perfect competition, written in 1944, and published in Germany in 1949. Although this was written independently, its main results were, as Stackelberg remarks in a footnote, anticipated by Professor Machlup in his article on the theory of foreign exchanges (*Economica*, Vol. 6, No. 24, 1939), and will therefore already be familiar to most readers.

An entertaining curiosum is furnished by S. G. Strumilin in his article on the " Time Factor in Capital Investment Projects ". This article, written in 1946, deals with the problem of depreciation and the rate of profit in the Soviet planned economy, and raises a number of problems familiar to Western economists.

To the reviewer the most interesting article is that by Georges Guilbaud on *The Theory of Games*. This article, written in *Economie Appliquée* in 1949, refers to the book by Von Neumann and Morgenstern. But M. Guilbaud is careful to tell us that " the present paper has only one thing in common with a proper account : it will encourage perusal of the work itself. I shall not consider myself bound to give a complete review of the subjects touched on in the book . . . I shall attempt rather to set some aspects of their work in a wider context . . . " The claim that the article should encourage us to peruse *The Theory of Games* itself is amply fulfilled. The article contains passages of fascinating interest, at any rate to the layman in this field. Unfortunately, however, the absence of a " proper account " of what has really been done in *The Theory of Games*, what precisely is its bearing upon the body of economic doctrine and what changes in that doctrine have been or must be wrought in consequence of Von Neumann and Morgenstern's work, still remains a serious stumbling block, at least to the present writer. Those of us who are in need of an elementary Guide to Economists on the economic implications of *The Theory of Games* are certainly not in a position properly to appreciate M. Guilbaud's meditations and variations upon the main theme. In spite of this, the paper—like the book itself—excites intense interest.

M. Guilbaud separates out three or four of the main strands of *The Theory of Games*, exhibiting each of them in his own way. First, the nature of the concept " preference " as applied to a group of individuals is examined. Part of this realm of ideas has recently become more familiar to us through the excellent monograph *Social Choice and Individual Values*, by K. J. Arrow. M. Guilbaud gives a clear exposition of the situations ranging from " total ordering " of preferences through " partial ordering " conforming to the transitivity condition to the generalised concept " effective preference " which lacks the fundamental property of transitivity. We see that once we give up the subterfuge of treating preference in an economic group as totally ordered in the same way as the choices of a single individual may legitimately be treated, once we substitute the complex notion of effective preference, the " solution " of economic equilibrium turns out to be a highly complex notion (Gilbaud, pp. 51 and 53). The old idea of uniquely determined results has to be abandoned, leaving us instead with a set of situations possessing certain properties. The analysis of such solutions gives rise to much mathematics. Some economists may feel doubtful about the necessity for all this. But to the present reviewer the reason which led Von Neumann and Morgenstern to this approach appears very strong : it is because they refuse to accept the Great Evasion of " perfect competition ", in which every individual in a group is somehow supposed to regard himself as acting in isolation, as a basis for their theory. Instead Von Neumann and Morgenstern work throughout with a group of individuals whose actions are mutually interdependent. The economic subject is pictured as some one engaged in a game against another person or persons. His actions in this situation are, then, seen to correspond with the actions of a person engaged in certain games. In other words, economic equilibrium is expressed in terms of the theory of strategy. Economists have, of course, used this approach in particular instances long before *The Theory of Games* was written. It is implicit in Edgeworth and Marshall's analysis of " the game of apples and nuts ". But although this had been discussed, and although Edgeworth had extended it to allow the number of persons in the market to increase indefinitely, the implications of this approach to the determination of economic equilibrium, including the theory of strategy, had not been drawn.

M. Guilbaud gives a short, succinct account of Von Neumann's and Morgenstern's theory of strategy in the simplest case : the case of two players in pure conflict (" The Theory of the Duel "). We see that in this simple case the strategy of both players is essentially defensive ; and in certain special cases this bi-lateral defensive strategy leads to a unique equilibrium even with pure strategies. " The case of pure conflict is completely resolved by Von Neumann's theorem " (Guilbaud, p. 64). M. Guilbaud also mentions the important key which Von Neumann and Morgenstern use to extend their analysis to cases other than pure conflict—introduction of the third " dummy " player who loses whatever the other two gain ; but he reminds us that in the view of the authors of *The Theory of Games* the theory of games with four players is not yet complete.

M. Guilbaud stresses the mathematical novelty of Von Neumann's and Morgenstern's technique ; and in reading this paper, as with the book itself, even the non-mathematical economist receives the impression that immensely powerful new tools are being forged. But tools for what? The question of just how far and in what way the ideas of *The Theory of Games* can be made to bear upon the body of economic theory has been raised repeatedly. M. Guilbaud has perhaps contributed something towards our understanding of this question in his article (the link between Von Neumann's approach and Edgeworth's re-contract analysis, for instance, stands out very clearly). But he does not claim to have systematically dealt with the question.

" We have tried in the above paper to give some indications . . . of the leading ideas. . . . They are full of promise but we must keep clearly in mind that the work has hardly begun. . . . An almost new mathematical technique needs to be created. This is indeed difficult, but probably much less so than mastering the new techniques, giving a meaning to the calculations and geometrical designs and establishing the links with other forms of thought."

The challenge to the mathematical economists to explain the bearing of the Theory of Games upon economic doctrine and to demonstrate the power of its new technique to solve the problems with which economists are concerned, remains outstanding.

H. MAKOWER.

The Problem of Long Term International Balance. Proceedings of a Round Table Discussion held by the International Economic Association at Monaco in September 1950. From UNESCO. *International Social Science Bulletin.* Spring, 1951. 93 pp.

This book publishes the main background papers (other than those dealing with particular countries) which were presented and discussed at the first Round Table discussion of the International Economic Association. It includes, among others, contributions by Professor D. H. Robertson (" The Terms of Trade "), Professor Colin Clark (" The Future of the Terms of Trade "), Mr. N. Kaldor (" Employment Policies and the Problem of International Balance ") and Professor J. Akerman (" The Problem of International Balance in Progressing Economies "). Of these papers it is the last which is most central to the subject set for the discussion: Long-term International Balance. Professor Akerman rightly concerns himself with the problem of international balance in conditions of varying national rates of growth of output. The paper suggests that if—as is realistic—we suppose that the rate of technical advance, of growth of capital and of increase in productivity is widely divergent between the countries, a major role to be played by international trade lies in the transfer of capital from advanced to backward areas. As a counterweight to the fundamental asymmetry in the world economy (that there is such asymmetry is suggested by the chronic dollar shortage) tariffs are to be used one-sidedly: countries with a long-term balance of payments problem are to levy tariffs on those with long-term surpluses. The proceeds of the tariff are to be used for investment purposes. " Public investment in under-developed means of production is made possible and the depression phase will be a process of international equalisation ".

Whether or not the line of approach sketched out by Professor Akerman in these few pages would in fact offer hope of harmonic progress in a world built up of many widely differing economies which are becoming ever more closely harnessed to each other, is a matter for further study. But certainly the problem he puts in the forefront —that of getting the different parts of the world economy to converge instead of diverging in their progress—seems a highly relevant one. Some of the other papers appear to use an approach which is perhaps not sufficiently dynamic for a study of long-term international balance; however, published papers from conferences of this sort do not always give a complete idea of the proceedings.

H. Makower.

The Wage Adjustment Board. Wartime Stabilization in the Building and Construction Industry. By John T. Dunlop and Arthur D. Hill. Harvard University Press. London: Geoffrey Cumberlege. 1950. xii + 166 pp. $3.50. 22s. 6d.

Government and Collective Bargaining. By Fred Witney. Edited by Joseph Shister. J. B. Lippincott Company. 1951. viii + 741 pp. $6.00.

Readings in Labor Economics. Edited by Francis S. Doody. Addison-Wesley Press, Inc., Cambridge, Mass. 1950. viii + 481 pp. $3.75.

Readings in Labor Economics and Industrial Relations. Edited by Joseph Shister. J. B. Lippincott Company. 1951. x + 661 pp. $4.75.

The building and contracting industry was unique among American industries in having a joint agency for wage control in wartime at work before wage control was imposed generally in October, 1942, and in continuing one, by the voluntary agreement of employers and trade unions, for more than a year after VJ Day. Mr. Arthur Hill, Acting Assistant Solicitor of Labour, became Vice-Chairman of the agency when it was first set up, in May, 1942, as a joint board of the government procurement departments and the trade unions, but not at that time of the employers; Professor Dunlop came in for the National War Labour Board when the building board was reconstituted and the employers joined it, in October, 1943. These two members have now written and documented the history of the Board. Their account deals in some detail with administrative procedure and the relations of the Board with other agencies, but has interest beyond its contribution to the study of wartime administration. Particularly is this so in their explanation of how the special characteristics of building, which are largely common to it in other lands, gave it its own distinctive form of wage control; their illustration of the problems that are raised as soon as a national wages policy comes to be applied on the job; and their discussion of the possibility of enforcing maximum rates in a world of labour shortage and cost plus.

Mr. Witney is an assistant professor of economics at Indiana University. His work is an account of the law of collective bargaining in the United States, and its effect on the growth and function of trade unions there. He writes not as a lawyer, but as a student of industrial relations, convinced of the social benefits of collective bargaining, and concerned to trace the effects of statute and case law upon it; his work expresses a wholehearted but reasoned acceptance of the trade union case. The first half follows the development of the law down to 1947, and most of the second half is then devoted to a point-by-point study of the practical consequences of the Taft-Hartley Act, to its almost invariable disadvantage. The book is long, but full of substance, and the author's ardour sustains its momentum. A valuable feature is the textual reproduction of the main statutes.

Two volumes of readings testify to the great developments of the study of industrial relations in the United States in the last twenty years, and provide the student with convenient surveys of it. The main theme of each is collective bargaining, but Professor Doody also gives articles on wages structure, methods of wage payment, and social security, and Professor Shister has considerable sections on trade union structure and function and on unemployment. Both volumes avoid matter of technical difficulty, and are concerned with the understanding of institutions rather than with the professional economist's work on the labour market. It is an admirable feature of both that they avoid snippets—indeed, Professor Doody makes it a rule to give only whole articles, and many of them he reproduces photographically in their original format.

E. H. PHELPS BROWN.

A la Recherche d'une Discipline Economique. Tome I. *L'Economie Pure.* By M. ALLAIS. Centre d'Étude Econometrique, Paris. 1943. (Printed for private circulation.) Vol. and annexes, 13 in., pp. 852 and 68.

M. Allais, an engineer by profession, has turned to economics and taken to building castles in the air. His architectonic labours are designed to synthesise economic theory; his limpid French and elegant mathematics to extend to six volumes. The book under review is the first in this ambitious series. Of immense size, and possessing the format of a metropolitan telephone directory, it is unlikely to attract many readers. It is presumably the function of a reviewer to say whether or not he regards this as a pity.

In some ways it certainly is a pity. Few can follow M. Allais' work for long without being moved by the skill and precision of thought and language with which he develops a subject. The assumptions are set out with admirable lucidity, the conclusions drawn with effortless ease. Even the complex notation, with its prefixes and suffixes, superfixes and occasional printer's errors, eventually acquires a logic of its own and succeeds in bringing light instead of bewilderment. He has written, in short, a book of quality, likely to leave its mark on the minds of those brave enough to read it to the end.

In other ways it is not a pity. The topics with which M. Allais deals are for the most part well worn. There is, for example, Paretian value theory and Paretian welfare economics. Of his treatment of the latter little need be said. Within its limits it is no doubt excellent. But one is somehow left with the unfortunate impression that M. Allais really does believe himself to have proved that competitive institutions and a free market will secure an ideal allocation of resources—will secure it, that is, in the real world, and not merely under the restrictive assumptions of the conventional Paretian analysis. In vain will the reader search for some sign of appreciation on M. Allais' part that the tastes of consumers are interdependent—that significant external economies and diseconomies do exist in consumption—and that to be even remotely useful a theory of welfare must base itself on this fundamental, if embarrassing, fact. In vain will he look for a discussion of the effects of uncertainty as to the future on the familiar marginal equivalences of the General Optimum—for a consideration of the argument that a monopolist's ' quiet life ' yields benefits which may outweigh the losses deriving from the alleged deviation from ideal output. These lacunæ exist. Nor are they the only ones. But their presence is to a certain extent compensated for by the quality of M. Allais' analysis of other problems. He introduces, to give but one example, the ' utility-possibility ' curve, which (independently discovered by Professor Samuelson) has recently shown itself to be a tool of great power; and he makes many incidental comments of wide interest.

His development of Paretian value theory is of course based on the twin assumptions that consumers maximise utility and firms money profit. The only comment I wish to make is that it is high time somebody investigated the forces determining the *period of time* over which a firm can be assumed to strive for maximum profits. None of the conventional results are really meaningful (in the sense of being testable) until one has specified the period of time with reference to which marginal costs and productivities are to be calculated. Moreover, much of the recent controversy in price theory hangs on little more than the effective length of the profit-maximising period. If it is very long, so that firms look far into the future, the view that demands are all fairly elastic, and competition fairly pure, gains considerably in plausibility—long-run marginal revenue may not be so very different from price if reasonable freedom of entry into the industry is assumed. If, however, the period is rather short, so that firms think only of today's rate of profit, marginal revenue and price may diverge quite considerably. In the former case average-cost pricing can be shown to have a curious rationality of its own; whereas in the latter it is unlikely to find many adherents.

M. Allais does not touch on these matters; but in a book so full of interest (and words and symbols) it is perhaps unreasonable to object to that. Indeed, the most important criticism of the book is probably simply that it is too long; that the reader has to work too hard to extract the wheat from the chaff; and that at the end he is too likely to be left wondering if his (not inconsiderable) acquisition of new ideas has not been purchased rather too dearly.

J. DE V. GRAAFF.

The Instability of a Dependent Economy. By C. G. F. SIMKIN. Oxford University Press. 1951. x + 208 pp. 18s.

In this comparatively short book Professor Simkin describes and elucidates the fluctuations of the New Zealand economy from 1840-1914. Not having at his disposal any statistics on national income he uses various substitute criteria: exports, those imports that may be dependent on income, public and private capital imports, and bank lending. These, he argues, are likely to be the major factors influencing and being influenced by national income in a dependent economy. One part of the book is devoted to a careful evaluation of the data available on these criteria and an assessment of the story they tell about New Zealand's cycles. The remainder of the book elaborates this story and at the same time sets the cycles in the perspective of New Zealand's economic development. It is a feat of deft compression and a valuable attempt to integrate the cyclical with the secular.

Some interesting conclusions on the nature of trade cycles in New Zealand emerge from Professor Simkin's study. Exports played a major part, but New Zealand cannot be depicted as having been helpless before the fluctuations of the industrial nations. The credit policy of her banks and the external borrowing of her Government both exerted a strong influence on her fortunes. Moreover, the rise in exports that initiated some booms had its origin in New Zealand. Thus it appears that the discovery of gold was largely responsible for the prosperity of the early 1860's; and the growth of exports after 1895 " was solidly based upon the development of new industries opened up by refrigeration " (page 169). There are, indeed, Schumpeterian overtones.

Two criticisms may be advanced. Professor Simkin is not always entirely clear on the forces that start an upswing or a downswing as opposed to those that explain its amplitude. When he writes on page 193 that " bank policy was thus the most important factor in the cycles we have examined," it appears at first sight that he is attributing to the banks an active part in causing turning points in cycles. But this is not so, for he later adds that it is only in the 1870's that bank loans " initiated cyclical movements as well as providing their main fuel ". How then are we to interpret the many other sentences in which he speaks of the " principal factor " without such a qualifying phrase ? The second criticism is that on occasion we are left with the feeling that we have not been shown the truly fundamental. The importance of credit policy is not to be decried. Nevertheless, who were the borrowers and why did they borrow ? Again, should we regard immigration and the accompanying flow of private capital as autonomous ?

These shortcomings, however, are outweighed by the merits of this book. It is a most useful addition to our knowledge and understanding of the trade cycle.

A. D. Knox.

Survey of United States International Finance 1949. By G. Patterson. Princeton University Press. Oxford University Press. 1950. x + 222 pp. 11s. 6d.

Invisible Trade of the United States in the Post-war Era. By L. A. Mayer. National Industrial Conference Board, Inc. 1951. 54 pp. Free on request.

Both of these publications are experimental. The first has the modest aim of " orderly, accurate, and discriminating reporting " on the policies and activities of the United States in the field of international finance during 1949. In successive chapters it surveys American gifts, loans and investments, policies towards exchange control and gold, dollar area - sterling area financial discussions, European economic integration, import policy and, finally, the balance of payments position in 1949. Throughout the survey is lucid and readable and does precisely what it sets out to do. In a restrained concluding chapter Professor Patterson writes : " A balance of the specific policies and activities during 1949 which advanced the general foreign economic policy of the United States of currency convertibility and non-discriminatory multilateral trade, as against those which obstructed the reaching of this goal, indicates that the balance tips towards the former. But the record is very mixed, and, if inaction in relevant areas is added to adverse action, the net effect of our policies was perhaps neutral or even unfavorable ". This is certainly the book to recommend to students who seek a clear and manageable picture of the mixed medley which composes American foreign economic policy. It is to be hoped that the experiment will inaugurate a series of such surveys.

The second of the present publications begins a new series of technical papers due to be issued by the Division of Business Economics of the National Industrial Conference Board. It analyses in detail movements and magnitudes in American invisible transactions over the period 1946 to the first quarter of 1950. It is shown that the net balance on all invisible accounts was reduced from $1.6 billion in 1947 to $1.0 billion in 1949. If income from investments is excluded and the considerable deficits incurred by the government included, there was a rough balance in 1948 and 1949.

D. J. MORGAN.

The Whitin Machine Works since 1831. By THOMAS R. NAVIN. Harvard University Press. London: Geoffrey Cumberlege. 1950. xxix + 654 pp. $6.50. 42s.

The Saco-Lowell Shops. By GEORGE SWEET GIBB. Harvard University Press. London: Geoffrey Cumberlege. 1950. xxxvi + 835 pp. $7.50.

These books are Nos. 15 and 16 in the Harvard series of Studies in Business History. Each follows the development of an American firm of textile machinery manufacturers from its first origins in the early nineteenth century to the present day. The two studies are similar in approach and organisation, and, being concerned with what have become two of the largest producers in a particular industry, they deal from time to time with common material and problems. Yet the books differ greatly in the stories they have to tell.

The history of the Whitin Machine Works is the history of the Whitin family. The Works have remained a family concern from the 1830's almost until the present day. Executive ability has been found inside the family, the daughters marrying it when the sons did not possess it, and family shareholders have been concerned more to choose the right men than to supervise their policies. Financial policy has been conservative from the beginning, profits being ploughed steadily back, bank loans avoided, and, broadly, ventures outside the field of textile machinery manufacture shunned.

The Saco-Lowell organisation, like Whitin, originated in the machine-shop basements of early cotton mills. In other respects it could hardly have been more different. Three separate ventures have united to form what is now Saco-Lowell; the need to follow the history of all three firms gives Professor Gibb's book less unity than the Whitin history, and at the same time lessens the value of earlier history as an aid to understanding Saco-Lowell as it now exists. Further, all three firms were founded and supported by Boston mercantile capitalists lacking trade outlets for their funds. Their whole history is linked with Boston's State Street, and is complicated by the liquidations, mergers, deals and reorganisations which have punctuated their individual and collective histories.

Material abounds for the economic historian: the growth of the firms in cotton mill basements, their sources and methods of machinery development and invention, the factors conditioning their development and use of accounting techniques, as well as hosts of minor details such as the persistence of the shilling as a unit of account. For the economist there is much to stimulate thought in the experience of these capital goods producers during periods of general prosperity or depression. The effect of general business conditions on the prosperity of the firms varies markedly over their life, and appears to be related both to the age of the textile industry, and to the nature, speed, and source of technological change within the machinery industry at any particular time. The facts seem much more capable of explanation in terms of some dynamic theory of a Schumpeterian type than by any principle of acceleration conceived in terms of given products and given relationships between consumer and producer goods industries. Major innovations apart, the importance of obsolescence resulting from minor changes and improvements in machinery design is striking.

There are also some interesting insights into entrepreneurial motive and behaviour, such as Otis Pettee's statement upon the proposed location of his plant :

> " My home is here, my land is in a good state of cultivation, fruit trees are beginning to bear, flower gardens and greenhouses are in a flourishing condition, and my family are comfortably situated. I see no reason why I cannot do as well here as anywhere else."

The books are useful sources of information on the American textile machinery industry. They could gain however, by some shift of emphasis away from minor details of personal history and towards technological detail.

J. Wiseman.

Economics of Employment. By Abba P. Lerner. McGraw Hill Book Company, Inc., New York. 1951. xv + 397 pp. 34s.

In this book Professor Lerner aims at giving a clear account in non-technical language of the Keynesian theory of employment, and combines with the exposition a powerful plea for the acceptance of the principles of ' functional finance ' as a means of maintaining a high level of employment without inflation. In Part I he gives the setting of the problem and a vivid picture of the advantages to be obtained in terms of individual liberty, welfare and happiness if it can be solved.

The solution is shown in Part II. The formal theory of the multiplier is demonstrated with admirable clarity and precision, though the use made of identities results in a causal interpretation of the process which is less satisfactory than the formal presentation. It is necessary to argue that income changes because people are being " led to believe " that their income is different from what it really is. A more convincing explanation would have been possible if a process analysis had been used ; but Professor Lerner will have nothing to do with such methods.

In the treatment of the rate of interest, the saving-investment identity is first used in an attempt to show that any one who may think that the desire to save or to invest affects the rate of interest is involved in error. " Neither borrowing for investment nor lending out of saving has any effect on the rate of interest. The investment brings about an increase in the supply of loans that offsets the borrowing, and the saving brings about an increase in the demand for loans that offsets the lending " (p. 108). The whole of this argument, of course, demonstrates nothing more than that when two concepts are defined as identical they remain identical. Later, Professor Lerner concedes that there may be some effect on the rate of interest if the money borrowed is not invested or otherwise spent or if the lending is not out of saving or other reductions in spending, and then restates this as the liquidity preference theory. Professor Lerner's liquidity preference is the total demand for money, both for transactions purposes and as an asset ; but he does not distinguish the transactions demand, and throughout the chapter gives no hint that the demand for money is functionally related to the level of income as well as to the rate of interest. Once this is admitted the statements quoted earlier are easily seen to be erroneous, since an increase in, say, borrowing and spending, by raising income, will increase the demand for money and so, in the absence of offsetting changes in the quantity of money or in the demand for money as an asset, will raise the rate of interest. Since, on his own assumption, a higher rate of interest will reduce investment, the rate of interest must play a part, together with income, in the equilibrating process. Much later in the book (p. 248), Professor Lerner does mention the change in the transactions demand for money resulting from a change in income, but apparently fails to see that this admission invalidates his earlier statements.

In the remaining five Parts of the book there are some interesting and provocative discussions of the resistances to the acceptance of the principles of ' functional finance ', the problem of inflation, the effects of the national debt, and international aspects of full-employment policies. There is an interesting section dealing with the principles of a wages policy for full employment, though here as elsewhere in the book one would like to learn more about ways of dealing with the many difficulties that would arise in applying the principles.

The clarity and force with which the arguments are presented make this a stimulating and useful book, if read critically.

A. W. PHILLIPS.

The Theory of Investment of the Firm. By FRIEDRICH and VERA LUTZ. Princeton University Press. Oxford University Press. x + 253 pp. 1951. $4. 25s.

The literature of capital theory concentrates on the accumulation and structure of capitalistic production, usually from the point of view of the whole economy. The firm, which performs the investment activities, is commonly left out of the theory, and comes into its own only in such other contexts as the theory of value. A gap exists between these (timeless) theories of the firm and the intrinsically dynamic theory of capital, which it is the purpose of the present book to bridge by explaining, with the help of a model of profit-maximising behaviour, how businesses make investment decisions when faced with the other alternatives of lending, holding cash and liquidating.

The method of explanation is *a priori*. At several points the development is interrupted while the conclusions so far reached are contrasted with matters as they are " in practice ", but these contrasts are really with other writers' theories. (For example, it is surely taking too much for granted to cite the full-cost pricing hypothesis as " practical " determination of output.) But these interruptions are incidental to the argument.

The essential assumption is that entrepreneurs will at all times maximise the rate of return on their *own* capital, rather than maximise the internal rate of return—an assumption used by Wicksell and Hayek. The authors emphasise that under such everyday conditions as an upward-sloping supply curve of loanable funds, the scale and so on of private investment may be quite different under the two criteria. Consider the case of a fall in the level of real wages. In the majority of the possible cases, businessmen will adopt less capitalistic methods of production, if they maximise their internal rate of return. This is the basis of the Ricardo effect. But if they maximise the rate of return on their own capital, the capital intensity of their operations might decrease, remain unchanged, or (in one conceivable case) even increase. General statements based on the reactions of " typical " firms are therefore misleading.

Another implication, unfortunately not discussed, is that businessmen may indeed be desirous of maximising the rate of return on their own capital, but only so long as it remains in the firm. There are two reasons why capital may leave the firm. First, business taxation may result either in governmental confiscation of capital, or at least in entrepreneurial withdrawal of capital to avoid such taxation. Second, there is the frequently mentioned attractiveness of consuming entrepreneurial capital, when low returns, short life and high death duties are considered. One should not expect a theory of the firm also to deal with private consumption decisions ; but it is important to understand the behaviour assumptions. The absence, in a work paying such close attention to marginal rates of interest, of any mention of the marginal rate of taxation is especially to be regretted.

The main argument develops through chapters on each type of investment : inventory, durable goods, cash, and on each source of funds : short and long loans, and equity. These are reached roughly in their order in the firm's balance sheet. Adding to the basic assumption as needed others about the investment " horizon " and uncertainty, the authors compute the optimum durability, scale, and replacement age of machines. The calculations (chiefly algebraical) are confined to paragraphs in small type placed after the conclusions which they demonstrate. Although these paragraphs are essential to a full understanding of the results, the authors have achieved remarkable clarity of presentation. The chapter entitled " Cost Accounting " is especially to be recommended for its discussion of quasi-rents and user cost as links between Marshallian long-run - short-run analysis and Fisher-Hicks period analysis.

Professor and Mrs. Lutz also find opportunity for comparing their demonstrations with standard theories. One chapter, for example, describes the obstacles to deriving a two-dimensional marginal efficiency of capital curve for a single firm using both fixed and circulating capital. Some insight is also given into the acceleration principle, the Ricardo effect, the concept of capital intensity, and the demand for cash. Finally, the book yields considerable information about firms' demand for and supply of loanable funds, and the contentious relationship between " assets " and investment decisions is implicitly discussed. However, there are so many external influences on the loans market that, in a final section on the " inadequacy of partial equilibrium analysis ", they conclude that the partial approach to the rate of interest must be replaced by a dynamised Wicksellian general equilibrium analysis. This discouraging outcome, however, should not deter the economist from reading the earlier chapters of what is certainly the clearest discussion of the principles of profit maximisation over time, when funds and anticipations are limited.

A. D. Scott.

The National Income of Malaya, 1947–49. By Frederic Benham. Government Printing Office, Singapore. 1951. 272 pp. 11s. 8d.

In spite of the numerous gaps in the statistical data, Dr. Benham has succeeded in estimating the national income of Malaya for the period 1947 to 1949. The aggregate national income is obtained by deducting from the estimated net national product the net income paid abroad as interest, profits and dividends. The method employed is simple, being based on the output of goods and services produced. Owing to inadequate statistics, it has not been possible to check the national income estimated in this way by alternative estimates based on incomes received or on expenditure on consumption and investment.

For some of his estimates, Dr. Benham has to rely on the information supplied by the trade or on sample surveys. Because of the lack of detailed information, some of the items are nothing more than " informed guesses ". For these reasons, Dr. Benham warns the reader that many of the figures which make up the total may be subject to a wide margin of error. This is especially so of the estimate for vegetables and fruits and of the items under manufactures and services.

However, so far as the aggregate figures of the national income are concerned, the author is confident that the margin of error is probably not more than 10 per cent. The *per capita* national income, according to his estimate, was £64 for 1947, £63 for 1948 and £58 for 1949. In money terms, it is the highest in South and South-East Asia.

Dr. Benham explains the decline in the *per capita* income during the period solely in terms of the fall in prices and money incomes. The influence of population growth should, however, not be overlooked: the mid-year population of Malaya increased from 5,820,000 in 1947 to 6,066,000 in 1949, an average annual increase of about 2 per cent.

The interesting note on 1950 gives a rough estimate of the national income for that year. The spectacular increase in the *per capita* income to over £90 was due to the boom in rubber and tin. The dependence of the whole economy on the prosperity of rubber and tin shows clearly the urgency of introducing measures to increase the level of productivity in these industries.

There is no doubt that Dr. Benham's work will be widely consulted as a standard sourcebook on the Malayan economy. The most useful sections are the notes on the various tables, for they contain a wealth of detailed information on the economic life of the country.

T. B. Lim.

SHORTER NOTICES

Esplorazioni Nella Storia del Pensiero Economico. By Albert Bertolino. La Nuova Italia, Florence. 1950. xi + 417 pp. L.1600.

This volume by the Professor of Political Economy at the University of Florence consists of a loosely connected series of essays, some of which are notably original in their range or subject, on economic thought from the Greeks and Romans to the 20th Century. The earlier essays—for example those on the England of John Gower, and on Bacon and Political Economy—are mainly on the borderland between economic thought and political and philosophical thought and history. The later essays converge on "L'Economia Keynesiana" and "La Politica Economica Moderna Secondo W. Beveridge".

Committee Decisions with Complementary Valuation. By D. Black and R. A. Newing. W. Hodge & Co. 1951. 59 pp. 10s. 6d.

This book, a sequel to earlier papers by one of the authors (Black), consists of an investigation into the stability of decisions arrived at by simple majority voting where there are several alternatives ordered by every voter. Sets of preferences are assumed to be of the single-peak variety and not necessarily independent. This field of enquiry is of theoretical interest as well as of practical importance; within the narrow framework chosen a pioneering attempt has been made to obtain general conclusions.

The book suffers from the disability of having been written before, and published after, the appearance of K. J. Arrow's *Social Choice and Individual Values*. Economists will find it difficult to read though the formulation and diagrams bring out interesting analogies with indifference contours and cobwebs. Whether the detailed enumeration of possibilities is of great value remains, however, doubtful.

Les Plans Monétaires Internationaux (Nos. 5, 8, and 9—" L'investissement international, sa morphologie ", and " L'investissement dans les territoires dépendants—I & I, II ".) Institut de Science Économique Appliquée.

The first of these volumes (No. 5) is concerned with definitions and an outline of existing institutional arrangements—the so-called " morphology ". Due emphasis is placed on the rôle of the State in underwriting the very considerable risks of such investment. The second work is in two parts (Nos. 8 and 9), which consider in more detail the nature of the problems of investment in dependent territories. The main interest of English readers will centre on the story of French colonial investment and the measures which have been taken—particularly since the end of World War II—to plan suitable programmes for French territories overseas (see No. 8, pp. 125 ff.). These are then compared with development schemes in operation in the British and Belgian colonial empires (No. 9). Finally, the threads are drawn together by a discussion of the possibilities of international co-ordination of the several national plans for colonial economic advancement.

Personal Income of Western Australia. By A. M. KERR. University of Western Australia, 1951. 107 pp. 7s. 6d. (Australian).

Detailed statistics of personal incomes in Western Australia may not seem of much interest to the British reader, but as an essay in approach this study should reach a wider public, since it contributes usefully to the methodology of national income estimation. It may also serve to remind us of the pioneering work done in the field of social accounting by H. J. Goodes in 1938 and which was published by the same University. From an Australian standpoint, the present work is also important, because (where comparable estimates exist) it provides the basis for an analysis of disparities in the income-earning potential of the several parts of the Australian Federation, which it is the object of the system of Commonwealth grants to modify if not eliminate. It is possible that it is an awareness of Western Australia's disabilities that has prompted this continuing and welcome interest in estimating community income.

Factors Affecting the Demand for Consumer Instalment Sales Credit. By Avram Kisselgoff. N.B.E.R. New York. 1952. ix + 70 pp.

In this monograph Dr. Kisselgoff discusses the factors influencing the demand for instalment sales credit in the U.S.A. He analyses the demand statistically by the single-equation and the equation-system approaches. The study has had to be confined to the rather short period 1929–41; during these years, however, the significant variable total current real income fluctuated considerably. Dr. Kisselgoff is cautious about applying his findings to the post-war period, particularly as regards hire-purchase of cars. The data are too restricted to represent, for example, the effect of the accumulation by consumers of liquid assets during and after the war.

The Economic Blockade. Vol. I. (History of the Second World War, U.K. Civil Series). By W. N. Medlicott. H.M.S.O., and Longmans Green & Co. Ltd. 1952. xiv + 732 pp. 35s.

This, the first of two volumes, takes the story of the activities of the Ministry of Economic Warfare down to the summer of 1941. Most of the book is about negotiations whereby neutral governments were persuaded to modify their trade with Germany, and as such is mainly a contribution to diplomatic history, with special interest to students of international law. Economists will seek explanation of the extraordinary propaganda whereby in 1939–40 Britain was almost persuaded that it could simply sit back and await the economic collapse of Germany. They will find most of it (substantially exonerating the Ministry if not the Minister) on pages 43–59.

Berühmte Denkfehler der National-Ökonomie. By Ernst Wagemann. A. Francke AG. Verlag, Berne. 1951. 272 pp. S.Fr. 14·50.

This book is by the Director General of the Economic Institute of the University of Chile (formerly Director of the Berlin Institut für Konjunkturforschung). It is a lively, but rather diffuse, survey of the intellectual errors of economists past and present, based on the chastening idea that it is the great *mistakes* which are the most stimulating part of the history of thought, and therefore most worthy of detailed study and contemplation by the contemporary student.

Advertising Expenditure in 1948. By Rodney Silverman. Newman Neame for the Advertising Association. 1951. xi + 99 pp. 21s.

Mr. Silverman was joint author with Nicholas Kaldor of the earlier survey of advertising in 1935. Mr. W. B. Reddaway acted as economic and statistical adviser for the present volume. The book is in two Parts, the first outlining the scope of the enquiry and its main results, and the second explaining in detail the sources of information and methods of estimation.

The survey is well organised and thorough; it still lacks a study of the distribution of expenditure by types of product. There is much to stimulate thought, e.g. in the fact that advertising expenditure, though now increasing, is still a significantly smaller percentage of national income than in 1938. Has the market been less well informed as a result?

Geschichte der Wirtschaftstheorie. By GERHARD STAVENHAGEN. Vandenhoeck & Ruprecht, Göttingen. 1951. 320 pp. DM. 19·50.

This new history of economic thought concentrates on the developments of the last 80 to 100 years. The book is just over 300 pages in length and Adam Smith is reached on page 31 and the Marginal Utility School on page 110. There is a great deal to be said for this emphasis. Dr. Stavenhagen also aims at great comprehensiveness, dividing his subjects up partly according to schools and methods, and partly according to the different branches of the subject. His survey includes the theories of money, location, international trade, and trade cycles, and this great comprehensiveness inevitably reduces the book at times to something of a catalogue. But it retains much of value and interest.

The Tableau Economique of François Quesnay: An Essay in the Explanation of its Mechanism and a Critical Review of the Interpretations of Marx, Bilimovic and Oncken. By HENRI WOOG. A. Francke, AG. Verlag, Berne. 1950. 100 pp. S.Fr. 15.

This addition to the "Staatswissensenschaftliche Studien" of Berne is a very interesting and able specialist essay in elucidation of Quesnay's macro-economic analysis of the circulation of payments. Along with a discussion of several of the very few constructive interpretations which Quesnay's *Tableau* has received, Dr. Woog makes a remarkably successful attempt at his own interpretation with the aid of Quesnay's "Analyse" and "Formule". This is a valuable contribution to a subject which is deservedly beginning to receive heightened attention and reconsideration.

National Income and its Distribution in Under-Developed Countries. Statistical Papers Series E., No. 3. United Nations. New York. 1951. 35 pp. 40 cents.

This short report summarises data of national income statistics of under-developed countries collected from a large variety of sources both private and public. Apart from the obvious international comparisons of national product, *per capita* incomes and their distribution, the report has a separate chapter on the relation of foreign investment income to geographical product. There are 30 statistical tables and a useful bibliography.

Domestic Financing of Economic Development. United Nations. Department of Economic Affairs. New York. 1950. 231 pp. 11s.

One of the resolutions passed by the Economic and Social Council requested the Secretariat of the United Nations to prepare a study of " methods of increasing domestic savings and of ensuring their most advantageous use for the purpose of economic development ". This report, prepared by a committee of experts on both public and business finance, is divided into two parts. In the first part the experts endeavour to summarise their discussion by listing the methods by which private, business and government saving can be encouraged in under-developed territories, and types of public and private agencies suitable to act as financial intermediaries in the transfer of funds to investment projects. No view is expressed about the relative advantages of different methods of domestic finance, although special attention is devoted to the official encouragement of credit corporations. In the second part of the report, prevailing practices in selected territories are recorded, including a short study by Sir Sydney Caine on the United Kingdom Dependent Territories.

Taxation in Mediæval England. By S. K. Mitchell. Yale University Press. London: Geoffrey Cumberlege. 1951. 413 pp. $5. 32s. 6d.

This book, a Yale Historical Publication, is a detailed study of the assessment and collection of royal financial levies from the reign of Henry II to the end of the reign of Henry III. Its great merit is that it emphasises the period as one of continual experimentation in the type of levy and in methods of assessment and collection, leading to the emergence of the levy on moveable property as the most fruitful source of occasional revenue. In arrangement it would have been better to discuss the basis of assessment first, and then the local before the central machinery. In this and in many detailed matters of presentation, though not of substance, the book lacks the ruthless editing and revision which the author's death prevented.

In the review of *The Exchange Stability Problem* by G. Stuvel, in the May 1952 issue, the name of the British publishers was inadvertently omitted. They are Basil Blackwell of Oxford, and the price of this edition is 21s.

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The Classical Monetary Theory: The Outcome of the Discussion[1]

GARY S. BECKER and WILLIAM J. BAUMOL

I. INTRODUCTORY

Recently a number of economists have shown a revived interest in the monetary theory of the classicists and of the members of the Lausanne School and their successors.[2] It has been maintained that all of these authors held basically common views which have been called " the classical system ". Moreover, it has been argued that this system suffers from serious formal shortcomings, in particular that either it is inconsistent or it must leave the absolute price level indeterminate.

We believe a summary of the results of the discussion is now appropriate, and that the conflicting views can be evaluated and to some extent reconciled. Moreover, the arguments can be stated rigorously without recourse to the mathematical apparatus which has been employed. A detailed restatement is therefore included in the belief that the discussion will become available to many who did not follow it before.

For our purposes we may consider the attack on the earlier writers to have been opened by Lange [13], although the discussion, as is indicated below, goes back much further. However, the immediate centre of contention is Patinkin's restatement and refinement of the Lange position. We shall therefore describe the Lange-Patinkin version of the classical system and the difficulties which they have shown to be inherent in it. A more satisfactory structure which Patinkin has called " the modified classical system " will then be outlined. Finally, it will be argued through re-examination of some of the classical writings that most of the group probably never held views like those ascribed to them. Indeed, it will appear that "the modified classical system" is a considerably closer approximation to their analysis. No doubt it is true that "the classics", particularly as the term has been used in the discussion, denotes too heterogeneous a group to permit wholesale judgement to be passed on the basis of selections from several members alleged to be representative. Nevertheless, many of the members of that group, among them some of those specifically accused, have passages in their writings which explicitly contradict the charges against them. We do not mean that none of these writers ever expressed himself incorrectly or in a misleading manner on this subject, or that they were all in possession of a full analysis of the logical structure of the problem. It does, however, seem that in most cases where the problem was considered *explicitly*, it was analysed in a manner which is at least formally valid.

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[1] The authors are indebted to Professors Viner and Brunner for their comments and suggestions.

[2] See references [1], [8], [12], [13], [14], [31]–[35], and cf. [17], [18] and [36]. But note Patinkin's reservation : " To minimise this [the problem of textual interpretation] . . . I shall confine myself to the mathematical economists of this [' classical '] school ". ([31], p. 4).

II. The Classical System according to Lange and Patinkin

Consider an exchange economy using (say) paper money as a medium of exchange. An individual who demands (supplies) a commodity gives up (receives) an equal value of the medium of exchange. If we call paper money a good and sum over all individuals, then by definition the total value of *goods*[1] (including money flow) demanded in this economy is identically equal to the total value of goods (including money flow) supplied. This result, which Lange calls Walras' Law[2], has nothing whatsoever to do with equilibrium in the various markets, and holds for *all* price configurations.

Suppose that at *any* given set of prices people will supply commodities when and only when they use (and intend to use) the money received to demand other commodities "immediately", i.e., during the period under consideration. Again, by summing over all individuals, we see that at any set of prices the total money demand for *commodities* will be equal to the total money value of the quantity supplied of all *commodities*. It is this which Lange and Patinkin have identified with Say's Law. Because it is taken to hold no matter what the price structure and to distinguish it from other versions of the "Law" we shall refer to it as Say's Identity.

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[1] "Commodities" are also considered "goods". Paper money is "a good" only.

[2] [13], p 50.

Patinkin in discussing his version of the classical system indicates[1] one particular set of circumstances which involves Say's Identity. He states that the classics, particularly the members of the Lausanne School, believed that money has no utility of its own, taking this to imply that in the static classical world there is no reason for any individual to desire any cash balances. Anyone who receives cash will try to exchange all his (useless) money for goods which have utility, so that, if there is a non-zero money supply, prices will rise indefinitely and the money market will be in equilibrium only with infinite prices.[2] Patinkin concludes that a classical economy can operate only if there are no stocks of money, and presents the paradox that this sort of "monetary" economy must in effect be a barter economy with a non-existent money acting only as a unit of account! Moreover, if people have no money stocks and never add, or want to add, to them, Say's Identity clearly holds, as it must in a barter economy, since commodities will be demanded at once in any exchange.

An immediate implication of Say's Identity, or rather an equivalent way of stating it, is that the quantity of money demanded, considered either as a stock or a flow, is independent of the price structure and is always equal to the quantity of money supplied. For at any set of prices, the value of the total quantity of commodities supplied is equal to the total (non-reservation or flow) demand for money. Likewise the value of the total commodity demand is the quantity of money flow supplied. Thus with Say's Identity the quantity of money flow demanded must always equal the quantity supplied.

Moreover, the quantity of money stock supplied and demanded (cash balances) will be equal when and only when the demand for and supply of cash flows are equal, because if there is, e.g., an excess supply of cash, people will want to get rid of more money flow than is demanded. Thus, Say's Identity holds if and only if the quantity of money (stock or flow) is always equal to the quantity supplied.[1]

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[1] [34], pp. 140-145.

[2] This equilibrium possibility is suggested by Brunner ([1], footnote 20, pp. 167-168). Patinkin ([32], footnote 7, p. 135) has argued that infinite prices are not economically meaningful. But surely they can be interpreted to mean that money is not wanted. For when money is worthless, the money price of any useful good must be infinite. Thus, economically, this is identical with the Phipps solution (see [35]) which requires that the price of money be zero. In this case people will throw money away because it will buy nothing. This alone should already raise doubts as to whether any classic ever meant that money has no utility in this sense. But Knight ([11], p. xxii) does believe that money has no utility in a static economy and anticipates Patinkin in pointing out the consequences of this view. Cf. also, e.g., P. N. Rosenstein-Rodan [39], Part II.

In our Say's Identity economy, let the money price of all commodities double (the quantity of money remaining unchanged or varying in an arbitrary manner). Since the relative prices of all commodities have remained the same we cannot expect buyers or sellers to make any substitutions among commodities. Only a substitution of money for commodities (an excess supply of commodities) is indicated, commodity prices having risen. But Say's Identity clearly precludes this too. Thus nothing will change with the change in price level.

It follows that the quantity demanded of each commodity will depend only on relative commodity prices. This is what is meant by the Leontief ([15])-Lange-Patinkin contention that the classical supply and demand (excess demand) functions are homogeneous of degree zero *in prices alone*. In particular, this functional form requires that the quantity of any commodity demanded or supplied be unaffected by a proportional change in prices no matter what is happening to the stock of cash—even if the stock of cash remains constant. It also requires that quantities demanded or supplied and relative prices of commodities, can never, even momentarily, be affected by the quantity of money.

The condition that equilibrum exists in all commodity markets can be sufficient at most to determine relative commodity prices. To determine absolute prices we must look at the remaining market—the money market. But the money market is *always* in equilibrium, no matter what the levels of the various prices. Hence, the condition that it be in equilibrium cannot be used to *determine* absolute prices. We conclude that in a Say's Identity economy, relative commodity prices are determinate, commodity quantities demanded and supplied depend only on relative commodity prices, and absolute (money) prices are indeterminate. Money is a " veil " since a good can have importance in the determination of equilibrium in the various markets of an economy only if the market for this good can conceivably be *out* of equilibrium.

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[1] The sufficiency of this condition was indicated earlier when Say's Identity was first introduced. Note that Say's Identity does not *require* that money have no utility, i.e. that demand (rather than *excess* demand) for money be zero.

In this version of the classical system the analysis of price determination is thus necessarily incomplete as it cannot specify (equilibrium) absolute prices.[1] According to Lange and Patinkin, the classics nevertheless sought to dichotomize the pricing process by determining relative prices in the " real sector " of the economy and absolute prices by introducing an additional relationship—the so-called Cambridge equation or its equivalent in a cash balance or other form of the quantity theory of money. This relates the quantity of money which people wish to hold to the price level by postulating that the quantity of cash the public demands will rise with absolute prices. Thus there would, *ceteris paribus*, be one and only one equilibrium price level corresponding to every level of the supply of cash—that at which people were willing to hold the amount of cash supplied. Clearly this contradicts Say's Identity which, as we have seen, requires that the quantity of cash demanded equal the supply *no matter what the price structure.*[2]

Thus, with the addition of a quantity theory or any other explanation of the absolute price level, this version of the classical system becomes self-contradictory. Without any such addition the system is incomplete in its explanation of the behaviour of the economy.

III. " The Modified Classical System "

The system just considered may be modified in a simple manner to eliminate the difficulties discussed. Patinkin[3] has called this revised model " the modified classical system ". To accomplish this we need merely drop the obviously unrealistic assumption that the quantity of cash demanded is independent of the price structure. We may assume that the quantity of cash demanded will increase with the money value of transactions.

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[1] Cf. Neisser [29].

[2] See Lange [13], p. 65, Patinkin [31], pp. 12-16, [32], p. 138. Patinkin's contention goes somewhat further than this, pointing out that with Say's Identity no matter how the stock of cash behaves, the quantity of cash (flow) demanded and supplied must both increase in proportion with prices, i.e. they must both be homogeneous of degree one in absolute prices. This is true since the quantity of money (flow) supplied is the money demand for goods, which is the sum of the demands for the various goods each multiplied by its price. Since the quantity of each good demanded is unaffected by a proportionate change in prices, the sum of these demands each multiplied by its price, i.e. the quantity of money supplied, must change in proportion with the change in prices. The same argument holds for the demand for money, and hence for the excess supply of money. Now the Cambridge equation does not call for the excess supply of cash flows to behave in this manner *irrespective of the level of the stock of cash.* The *form* of the Cambridge relationship is thus in contradiction with the *form* assumed for the money excess supply function. It is this which Patinkin has called " Invalidity I " ([32], p. 138). The next paragraph in this paper summarises his " Invalidity II " (*Ibid.*, p. 141).

[3] [31], pp. 23-26, [32], pp. 143-150 and [33].

Suppose then that the prices of all commodities double, and that as a result, the quantity of money demanded doubles. Since the relative prices of commodities have remained unchanged, there will not be any substitution among commodities. People *will*, however, seek to increase their cash holdings by giving up commodities, i.e., by increasing the quantities of commodities (in money terms) they supply or decreasing the quantities they demand. We can conclude that when there is a significant money market, the demand for commodities cannot depend merely on relative commodity prices, but must also depend on absolute money prices. Thus, any attempt to dichotomize the pricing process by determining relative commodity prices in the commodity markets alone, is impossible (except in a very special sense indicated below) once a significant money market exists.[1]

The situation we are now considering is thus clearly inconsistent with Say's Identity—supply of all commodities does not necessarily equal total demand for all commodities. In particular, these will not be equal if the price structure is such as to cause the quantity of cash demanded to differ from the supply. Nevertheless, the present authors would like to point out that the ambiguous proposition called Say's Law can be interpreted in a way which makes it compatible with an economy in which the absolute price level does matter. This form of Say's Law, which we will call Say's Equality, states in effect that " supply will create its own

[1] Thus, if any equilibrium is possible, a Cambridge equation, or anything else implying that the quantities of money demanded and supplied are not equal at all price levels, requires that quantities of commodities supplied and demanded be not homogeneous of degree zero in prices alone. This can also be seen as follows: suppose prices, originally in equilibrium, are doubled, the stock of cash remaining constant, and that the quantities of cash stocks and flows demanded now (say) exceed the supply. By Walras' Law the quantity of some commodity supplied must exceed the demand. The demand for or the supply of that commodity must then have changed as a result of the change in price level alone, in violation of homogeneity. Hence, Hickman's system ([8]) which involves both a Cambridge equation and the assumption that the quantities demanded and supplied of all commodities are homogeneous of degree zero in prices alone, must be in error. What he has done, in effect, is assume that the quantity of cash stock demanded can differ from the supply (the Cambridge equation) whereas at the same time (Say's Identity) the quantity of cash flow demanded is identically equal to its supply, so that there are two separate conditions giving equilibrium in the monetary sector of the economy. Brunner has pointed out to us that this last sentence is not quite accurate—Say's Identity is not directly involved in Hickman's argument. However it comes close enough to the source of his difficulty for present purposes.

The argument of this footnote also indicates that the difficulty in the system attributed by Lange and Patinkin to the classics arises out of the homogeneity assumption, since this precludes inequality in money supply and demand. Say's Identity, since it implies homogeneity, provides a special case of this difficulty. Patinkin seems to have been the first to observe this point.

demand," not despite the behaviour of the price level but because of it. The comparative statics argument is that an excess supply of goods, obtained by disturbing a market equilibrium situation by a cash reduction, will cause the price level to fall to just that point where the excess demand for money is eliminated, since the price level will fall so long as and only so long as there is an excess demand for (insufficient supply of) cash. The foregoing is, in effect, the reasoning behind the cash balance forms of the quantity theory of money and, incidentally, the Pigou effect.

The Cambridge equation implies that for every relative price structure there exists a unique absolute price level at which the money market will be in equilibrium (Say's Equality). This is equivalent to stating that for every set of relative prices there exists a price level which brings about *over-all* equilibrium in the commodity markets, i.e., the total quantity of money offered for commodities is equal to the total value of commodities supplied. Thus it is clear that this version of Say's Law is compatible with determinacy of an absolute price level.

Now assume that we start from a position of equilibrium in all markets. When all commodity prices and every stock of money doubles, the equilibrium is unaffected.[1] No substitutions take place since a proportionate change of commodity prices precludes substitution among commodities, and a substitution between commodities and money is rendered unnecessary, the doubled demand for money being satisfied by the augmented supply. This invariance is to be expected since in the models considered so far a doubling of the stock of money and all prices is strictly equivalent to a change in the unit of account (the "let's call fifty cents a dollar case") and, in effect, involves only a change in the name given the monetary unit.

If we assume that there never exists more than one set of prices compatible with equilibrium (the dangerous uniqueness assumption so often implicitly employed in comparative statics arguments) we arrive at the following comparative statics result: a doubling of the stock of cash *will* double equilibrium prices. Once again money is merely a veil. The phrase is, however, now used in the following comparative statics sense: the quantity of money in circulation affects only the equilibrium price level *and has no effect at all on equilibrium relative commodity prices*, and hence involves no inter-commodity substitution once a new equilibrium is attained. Thus the price system can legitimately be dichotomized into a " real " sector and a monetary sector, but only in a discussion of *equilibrium* relative prices.

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[1] We require that *every* stock of cash doubles, and not just that the total quantity of cash in the system double, since the effects of an injection of cash will obviously vary with the method employed to introduce it. If given to the miser who sews it into a mattress, the effect will evidently be quite different from that of a gift to someone who spends it at once.

IV. THE ROLE OF NON-MONETARY ASSETS

We already have all the material we need for an examination of the charges against the classics. However, it may be of some interest to digress briefly into a discussion of the role of assets which has played an important part in the models examined by Patinkin and the Keynesian systems.

Hitherto we have explicitly assumed the absence of non-monetary assets and, consequently, of an interest rate. We now drop this assumption to permit the existence of bonds. For the moment we also postulate an exchange economy, thus abstracting from production although, of course, this does not make economic sense if time is not also abstracted from. It may be assumed because of the similarity in function between bond holding and money holding, that the community desires to hold the real value of its bonds constant,[1],[2] so that now with a doubling of all cash stocks and all commodity prices[3] from initial equilibrium levels the asset market will not be kept in equilibrium. The quantity of bonds demanded will double (in money terms) without carrying the supply along with it. This yields a comparative statics result for an exchange economy with non-monetary assets : a change in the supply of money cannot merely raise all commodity prices proportionately, leaving relative commodity prices and the interest rate unchanged. Necessarily relative commodity prices, the interest rate, or both of these, will change. Money is no longer a " veil " in any important sense.

Prior to the introduction of non-monetary assets, our results held for a producing as well as for an exchange economy. To indicate one way in which production may affect an economy with real assets let us consider the following situation. Despite a zero net investment there exist capital goods which all wear out at the end of one production period (equal in length to the exchange period), and hence must be replaced. Bonds of one-period duration are issued to finance this gross investment, these being the only bonds in existence. A doubling of cash stocks and prices which were initially in equilibrium will still preclude inter-commodity and commodity-money substitutions. In the asset market, the money value of the bonds issued must double to keep the real value of the capital goods constant.[1] But since the demand for bonds may also be expected to double, equilibrium is everywhere preserved. We may conclude that a change in the supply of money will (again using our uniqueness assumption) change all commodity prices proportionately, and leave relative commodity prices and the interest rate unchanged,[2] so that money will once again be a " veil " in a comparative statics sense.[3]

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[1] The Cambridge equation assumes that it desires to hold the real value of its money constant.

[2] This assumption is related to that made by Patinkin ([31], p. 18) and Brunner ([1] *passim*).

[3] The interest rate (thus the price of bonds) remaining constant.

V. The Position of " The Classics "

We may sum up the allegations which have been made against the classics in the following three charges:

1. that they believed that cash has no utility of its own in the extreme sense that, in the static model which the classics (meaning in particular the members of the Lausanne School [cf. fn. 2, p. 1, of this paper]) are alleged to have employed in their monetary analysis, people should, if consistently pursuing their own desires, seek to get rid of all their money as soon as possible;

2. that the classics believed that supplies of and demands for all commodities are homogeneous of degree zero in prices alone and so cannot be affected even momentarily by the quantity of money, and that they sought thus to dichotomize the pricing process, explaining the movement of (equilibrium and non-equilibrium) relative prices in the " real sector " alone, and the price level in the monetary

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[1] Patinkin ([31]) fails to indicate how the bond supply behaves, and seems to conclude (p. 19) that because the demand for bonds will be homogeneous of degree one in prices, so will the excess demand for bonds.

[2] In technical terminology we can say that the demand for and supply of each commodity is homogeneous of degree zero in commodity prices and the quantity of money. The supplies of and demands for bonds and money are homogeneous of degree one in the quantity of money and commodity prices.

[3] Since the supply of money does not affect the interest rate, the explanation of the level of interest must be found in " real " factors. Cf. Patinkin [33].

sector by means of a quantity theory (illegitimately) superimposed on the system ;[1]

3. finally, that by Say's Law they meant Say's Identity which states that the supply of commodities will create its own demand irrespective of the behaviour of the stock of cash and the price level.

Clearly these charges are not unrelated. Yet it may be worth investigating the attitude of " the classics " on each of these points simply because the authors may conceivably have failed to see the connection and illegitimately have accepted one of these and yet rejected one of the others which follows from it.

In the discussion we trust we have avoided reading too much into the classics in concluding that many of them held views more acceptable than those which have been attributed to them. Certainly we do not mean to imply that they always fully understood the perils they thereby avoided. It may be added that we began our investigation expecting considerably weaker results, and were most surprised to find how clearly many of the classics had expressed themselves on these matters.[2]

VI. The Utility of Cash

Here we may begin with no less an authority than J. B. Say who recapitulates his views on this question by stating, " I have . . . pointed out the various utility of gold and silver as articles of commerce, wherein originates their value ; and considered their fitness to act as money, as part of that utility ".[3] He had already noted that " paper (money) has a peculiar and inherent value ", and, indeed, gone into this point at length.[4]

Ricardo was, of course, less interested in the question of the relation between utility and value. Nevertheless, Marget[5] takes this statement that its employment as money merely adds to the list of uses of bullion to imply that added utility is imparted to metal by its becoming money.

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[1] This is what Brunner ([1]) has called " the complementarity property," meaning thereby that a separate money equation is superimposed on the system to complement the real sector.

[2] The authors decidedly do not consider themselves experts in *Dogmengeschichte*, and so are forced to rely heavily on pilfered references coming largely from those extraordinary two volumes ([19]) where, conveniently, Professor Marget subjects closely related allegations to most painstaking examination (see esp. Vol. II, pp. 8-124). No attempt has been made at an exhaustive survey of the literature.

[3] [42], p. 228. He is arguing against Garnier, translator of the *Wealth of Nations*. Locke had said this by implication [16], pp. 578-582.

[4] *Ibid.* p. 227, but cf. p. 133, esp. the footnote. It is noteworthy that in later French editions Say decided paper money was of sufficient importance to warrant a separate chapter (see the 6th edition, p. 256, and Chapter XXVI).

[5] [19], Vol. II, p. 31, footnote 81, where Turgot and Law are cited to the same effect. For the Ricardo references see [37], pp. 9-10.

Senior can also be cited to this effect,[1] and Marget[2] points out that Jevons wrote of "the 'utility' of 'that quality of money' which a man 'will desire *not* to exchange'". Wicksteed[3] speaks of the marginal significance of gold being raised by its use as a medium of exchange, as well as its use as a standard of value. And while Marshall, in speaking of the constancy of the marginal utility of money presumably referred to income rather than cash balances, there is at least one point in the *Principles* in which his money unmistakably means cash,[4] and in which he goes into detail on "the marginal utility of ready money".

Surely Patinkin is not justified in citing Walras as one of those to whom money has no utility. His only reference (indeed his only "damning" reference to Walras) is to the statement, "Soit (U) la monnaie que nous considérerons d'abord comme un objet sans utilité propre . . .".[5] This is hardly conclusive, and it may well be meant to indicate no more than the author's intention *at that point* to deal only with monies like paper rather than, for example, gold. In any case, it includes the phrase "d'abord" (to begin with). Indeed it would be most strange for one who has been hailed as a mighty protagonist of the cash balance approach,[6] to find Walras denying utility to cash. But we have better evidence than this. In his *Théorie de la Monnaie* he makes it abundantly clear that he is most pleased that the theory of money provides such a fine and important application of the theory of marginal utility[7] and more than once speaks of the *rareté* of money[8] after having pointed out that this is the term he had appropriated from his father to designate marginal utility.[1]

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[1] [43], p. 23 ff. McCulloch argues that coins "exchange for other things, because they are desirable articles, and are possessed of real intrinsic value" [21], (p. 135), but by this he may mean their value as metal, and is willing, though not without hesitation, to exempt drafts, checks and bills from this conclusion. Indeed, elsewhere (p. 217) he has sellers lend or spend their money immediately upon receipt.

[2] [19], Vol. II, p. 56, footnote 14.

[3] [48], p. 600 (Vol. II).

[4] [24], p. 335 and footnote.

[5] [44], p. 303.

[6] See Marget [17] and esp. [18] for a spirited defence of Walras on these points written some twenty years before the Patinkin articles. After writing this the authors found that Professor Jaffé had, in a paper delivered at a meeting of the Econometric Society, pointed out Patinkin's misinterpretation of Walras on the utility of cash balances. For a summary see [10], pp. 327-8.

[7] [45], esp. the introduction, pp. 65-70.

[8] *Ibid.*, esp. p. 102. He is presumably speaking of the utility of availability of cash which he distinguished from the utility of money *per se*.

Pareto is another of the only five " classics " (Walras, Pareto, Wicksell, Cassel and Divisia) whose work is specifically cited by Patinkin as an example of the mishandling of monetary theory. No doubt Pareto's monetary theory is considerably more superficial than that of Walras. Nevertheless even in his case the charges are questionable. As with Walras, Patinkin provides us with only one specific reference to prove that any of his charges apply to Pareto, and again this reference is intended to show that in the Paretan system money has no utility. But the choice of passage is here even more strange. The only reference to money on the page cited is the following : " La monnaie étant une marchandise doit avoir pour quelques individus une ophélimité propre ; mais elle peut ne pas en avoir pour d'autres ".[2] Surely this is the contradictory of Patinkin's allegation ! Indeed, Pareto goes further—in effect reprimanding those others (?) who maintain that money has no utility : " La monnaie remplit deux rôles principaux : 1° elle facilite l'échange des marchandises ; 2° elle garantit cet échange . . . C'est parce qu'on n'a pris parfois en considération que son premier rôle qu'on n'a vu dans la monnaie qu'un simple signe sans valeur intrinsèque ".[3]

The list is by no means exhausted, but there seems little point in going on. " The classics " did not generally believe that the holding of cash balances adds nothing to utility beyond that which will eventually be derived by spending the money.

Of course there are those who might appear in some looser statements to have argued otherwise. J. S. Mill did argue that " money, as money, satisfies no want ",[4] but he wanted only to point out that money is valuable only because commodities can be bought for it,[5] a homily that should find few dissenters. Divisia more explicitly[6] and Knight by implication[7] have clearly denied a utility to money. In general, however, it seems rather difficult to find classicists taking the extreme form of the position attributed to them by Patinkin.

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[1] *Ibid.*, p. 66.

[2] [30], p. 593. It is cited by Patinkin in [34], p. 140, footnote 5.

[3] [30], p. 451.

[4] [28], p. 6 (Preliminary Remarks). See also Hume [9] (" Of Interest "), p. 321 to the effect that money has "chiefly a fictitious value ".

[5] Thus compare [27], pp. 69-70.

[6] [5] Chapter XIX and the Appendix.

[7] [11], p. xxii.

It may be remarked that the sort of statics which would be required to deprive money of utility in Patinkin's sense would be very special indeed. Transactions demand would be eliminated only if wage payments and all other receipts were staggered in time and amounts so as just to cover the transactions which the recipient desires to make at the moment he desires to make them. This would happen in particular if receipts and payments coincided in a steady stream.[1] Where these requisites do not hold, money derives a " utility " from the goods it can buy, it is true, but because it can buy them at the moment the buyer considers convenient.

VIII. Homogeneity of Demands and Supplies in Prices Alone

The " Pigou effect "[2] consists of a rise in the quantities of goods and services demanded with a fall in absolute prices, arising from the resulting increase in purchasing power of all cash holdings. This is a complete denial of the homogeneity postulate, for it permits the demands for goods to be affected by a change in the price level alone, relative prices remaining unchanged. If we are not to call the title of Professor Pigou's article misleading, this effect is part and parcel of the classical stationary state, and there is no more to be said upon the subject.

However, the homogeneity (dichotomization) allegation is really at the heart of the charges under examination, and so is worth some further investigation.[3] First it should be noted that even an unqualified statement that the quantity of money may not affect the quantities of the various commodities demanded and supplied need not mean that the author believes in homogeneity of supplies and demands in prices alone. This may merely be the following (comparative statics) assertion which has been argued above (following Patinkin[1]). If all cash stocks are raised in proportion all prices will rise in proportion, and thus there will be no change in quantities demanded or supplied once a new equilibrium is attained, even in the " modified " classical system. This is not the same as the homogeneity assumption which would never have permitted the quantities of the commodity demanded and supplied to vary even temporarily with the changed stock of cash (no matter how it is injected). What we must then disentangle is which of these, if either, approximates the views of the writers in question.

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[1] This can to some extent be arranged artificially by investing money the moment it is received with provision for repayment the (perfectly foreseen) moment it will be needed. But this would only be done to the extent necessary to eliminate demand for cash completely if there were no transactions cost of making and then calling in the investment, and if, in addition, no effort were required in carrying out this transaction. Where these are not abstracted from, it will pay to hold at least small quantities of cash for payments planned for a time shortly after the money has been received, " perfectly " static world or no. It is true that if loans were perfectly safe (the outcomes perfectly foreseen) the distinction between cash and securities might disappear, but not the distinction between the " money-securities " and " real assets", and the latter would still have a positive yield because they are not convenient means of payment and so not perfectly liquid.

[2] [36], pp. 349-350. Note the relation to Say's Equality.

[3] Indeed, dichotomization accusations and denials always seem to have flown thick and fast. Locke ([16], p. 582) and Say ([42], p. 226) most emphatically insisted that dichotomization is illegitimate, arguing that, " . . . money . . . is a commodity, whose value is determined by the same general laws, as that of all other commodities ". (Say, *op. cit.*, p. 226). Ricardo accuses Malthus and others (not completely specified) of saying that money is a commodity " . . . subject to the same laws of . . . value . . . as other commodities ", yet reasoning in an erroneous manner which showed " that they really consider money as something peculiar,

The literature is quite rich on the effect of an injection of cash, going back to Cantillon and Hume, both of whom make it abundantly clear that they are having no truck with " the homogeneity postulate ". Thus Cantillon wrote,

> " Through whatever hands the money which is introduced may pass it will naturally increase the consumption ; but this consumption will be more or less great according to circumstances. It will be directed more or less to certain kinds of products or merchandise according to the idea of those who acquire the money. Market prices will rise more for certain things than for others however abundant the money may be ".[2]

Similarly, Hume wrote,

> " . . . we find, that, in every kingdom, into which money begins to flow in greater abundance than formerly, everything takes a new face : labour and

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varying from causes totally different from those which affect other commodities ". ([37], pp. 72-3. See also [38], p. 292, and [37], pp. 9-10). Yet this same charge is brought against Ricardo by Cannan ([2], p. 182) and, in effect, Leontief ([15]). Similarly Senior attacked James Mill on this ([43], pp. 8-9), while J. S. Mill explicitly affirmed that the value of money was determined like that of other commodities ([28], Book III, Chapter VII, Section 3, p. 488). To Walras the theory of money provided " . . . une des premières et des plus décisives applications de mon système d'économie politique pure " (i.e. his marginal utility theory). (See [45], p. 69) ; while Ohlin has lauded Wicksell for " this ' new approach (!) ' to monetary theory", for " Until then, and as a matter of fact for long afterwards, it was regarded as self-evident that . . . a change in the general price level must be due to entirely different circumstances from a change in individual prices ". ([46], Ohlin's introduction, p. xiii).

[1] [31], p. 23, [33], p. 53.

[2] [3], p. 179.

> industry gain life ; the merchant becomes more enterprising, the manufacturer more diligent and skilful, and even the farmer follows his plough with greater alacrity and attention . . .
>
> " . . . though the high price of commodities be a necessary consequence of the encrease of gold and silver, yet it follows not immediately upon that encrease . . . At first, no alteration is perceived ; by degrees the price rises, first of one commodity, then of another ; till the whole at last reaches a just proportion with the new quantity of specie . . . "[1]

Malthus seems to have accepted Hume's analysis, and indeed to have cited it with approbation, but Ricardo's attitude can at best be described as lukewarm.[2] McCulloch felt that Hume had exaggerated the beneficial effects of an influx of money, but nevertheless contested James Mill's out-and-out denial of the validity of Hume's argument.[3] Note, however, that even if McCulloch (like Walras, as Patinkin himself observes[4]) believed in "just a little non-homogeneity", e.g., believed that prices will rise sufficiently quickly and close to proportionately to render nugatory the impact effects of an influx of cash, he has escaped Patinkin's problems. He has accepted the "modified" classical system, the argument with Hume being only over the time path between the two equilibria which is irrelevant to the present discussion.

J. S. Mill also supported this sort of position,[5] but perhaps the clearest statement is to be found in Marshall's testimony before the Gold and Silver Commission to which the reader is referred.[6]

The case of Wicksell is worth special consideration, especially since he is under particular attack by Patinkin on this point.[7] Wicksell in his writings explicitly employed the device of proceeding from the (over) simple to

[1] [9], p. 313.

[2] [38], pp. 387-388 and the reference to Malthus given there. For a case of non-homogeneity in Ricardo, see [38], p. 179.

[3] [21], pp. 556-557. But note that James Mill did not commit himself to homogeneity but argued rather that if the additional money were used to augment demand, prices would rise at once and rob this money of its value. See [26], pp. 160-161.

[4] [31], p. 12, footnote 5.

[5] [28], Book III, Chapter VIII, Section 2, and the second essay in [27].

[6] [23], esp., pp. 38-52. It is noteworthy that at one point Marshall even included the stock of assets among the determinants of the demand for cash ([22], p. 44, as cited by Hansen [7], p. 2). However, Marshall never seems to have done much with this.

[7] [31], p. 12, footnote 5, and [32], p. 149, footnote 30.

the complex. Hence it is dangerous to attribute lack of sophistication to him on the basis of isolated passages, since these may be preceded by a warning and adequately qualified later. Thus, as Patinkin points out, at several points[1] Wicksell states that the demand functions for commodities will depend solely on relative prices. But on each occasion the assumption provisionally made is that money serves only as a unit of account and a medium of exchange, and its function as a store of value is explicitly abstracted from.

However, he knew well enough how to deal with homogeneity :

> " . . . let us suppose that for some reason or other commodity prices rise while the stock of money remains unchanged, or that the stock of money is diminished while prices remain temporarily unchanged. The cash balances will gradually appear to be *too small* . . . I can rely on a higher level of receipts in the future. But meanwhile I run the risk of being unable to meet my obligations punctually, and at best I may easily be forced by shortage of ready money to forgo some purchase that would otherwise have been profitable. I therefore seek to enlarge my balance . . . through a *reduction* in my *demand* for goods and services, or through an *increase* in the *supply* of my own commodity . . . the universal reduction in demand and increase in supply of commodities will necessarily bring about a continuous fall in all prices. This can only cease when prices have fallen to the level at which the cash balances are regarded as *adequate*."[2]

It is true that Cassel did commit himself to (the macro-economic parts of) the model which Patinkin has called the classical system, and, indeed, the difficulties in which this involved him have been noted before.[3]

In sum there seems to be considerable ground for doubt about the validity of the attack on the classical system. Yet somehow Patinkin's argument is not completely pointless. Somewhere the impression seems to have arisen (and to have gotten into teaching) that this was indeed the nature of the classical system. Indeed, some of the classics themselves have, as we have seen, represented the contrary views as corrections of errors widely held. Keynes' polemics may have contributed considerably. One important source of confusion is, no doubt, the superficial resemblance between the valid comparative statics assertion that equilibrium relative prices may be unaffected by the quantity of cash (if injected into the system in an appropriate manner), and the position ascribed by Patinkin to the classics that relative prices can never be affected by the quantity of cash (however injected), even temporarily.

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[1] [46], p. 23, [47], Vol. I, p. 67, and Vol. II, p. 22.

[2] [46], pp. 39-40 (Wicksell's italics).

[3] See the excellent discussion by Marget [19], Vol. II, pp. 338-341, also Wicksell [47], Vol. I, pp. 224-225 ; Cassel [4], pp. 150-152.

The nature of the mathematical notation employed may also partly be responsible. The demand and supply functions were usually written as functions of prices alone with no explicit cognizance taken of the quantity of cash or anything else, including money income, all of these having been held in abeyance via *ceteris paribus*. This may indicate merely that an author using this notation had for the moment not thought explicitly about the role of cash, or considered it unimportant at that point. Nevertheless, confusion about demands and supplies being homogeneous of degree zero in prices alone, may have arisen in this manner.

A particularly apt case in point is that of Lange himself who, as Patinkin shows, has gone wrong on just this point in the mathematical appendix to his book.[1] Yet much of the book itself is devoted to an examination of the effects of changes in the stock of cash and the price level on the quantities of individual commodities demanded and supplied, i.e., to a discussion of the effects of the absence of homogeneity in prices alone!

IX. SAY'S IDENTITY

This section will necessarily be the most inconclusive in our examination of the "classical views". This is largely because Say's Law seems to have been used ambiguously in most cases, the writers for the most part not having considered the relation between the law and the nature of the money market. Moreover, several different propositions have been referred to as Say's Law. Say himself, besides formulating the proposition[1] which has caused so much controversy, confused it with two different, considerably more innocuous, assertions.

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[1] See Lange [12], pp. 99-103. The Patinkin discussion of this point is in [31], pp. 18-20. This is not to deny that some recent mathematical theorists have adopted monetary analyses involving dichotomization of the real and monetary systems throughout their works. Indeed Brunner may well be right when he maintains in a letter to the authors that such an approach had recently become well entrenched.

The first is the tautological proposition that there will always be a market for all goods produced where we define a good to be something which can be sold at a price covering its costs.[2]

The second is the almost Keynesian view that demand will not exist without production since production creates the income with which goods can be bought.[3]

However, Say has also advocated the more familiar proposition, and at one place he makes it clear that he is thinking of the equality rather than the identity, but in a rather peculiar form.

> " Sales cannot be said to be dull because money is scarce, but because other products are so. There is always money enough to conduct the circulation and mutual interchange of other values, when those values really exist. Should the increase of traffic require more money to facilitate it, the want is easily supplied, and is a strong indication of prosperity . . . In such cases, merchants know well enough how to find substitutes for the product serving as the medium of exchange or money [by bills at sight, or after date, bank-notes, running-credits, write-offs, etc. as at London and Amsterdam] and money itself soon pours in, for this reason, that all produce naturally gravitates to that place where it is most in demand ".[4]

Thus Say is operating with a nearly Wicksellian credit economy in which price level is indeed indeterminate. But this is so not because the quantity of money (and credit) has no influence, but rather because the quantity of circulating medium will vary by just the amount necessary to maintain any price level !

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[1] Say's Law has been attributed to James Mill, but this judgement is not universally accepted. Though most of its components can be found there, the first edition of the *Traité* which appeared in 1803 had no well organised discussion of the " Law " (but McCulloch ([20], p. 21), seems not to have noticed this—note also the incorrect date given there). Before the second edition with its extended discussion of the Law appeared in 1814, James Mill had published his *Commerce Defended* ([25]) in which the argument is developed at length.

[2] For references see Lange [13], p. 60, footnote 15, and Neisser [29], p. 385, footnote 4. In particular see Say's last two letters to Malthus (published posthumously) and Malthus' reply to the first of these in [41], pp. 502-515, esp., pp. 504-505, 508 and 513.

[3] This argument is found in many places in Say's discussions of the Law. See [42], pp. 136-137, reproduced in [40], pp. 340-342, and [41], p. 441.

[4] [42], p. 134. The insertion in brackets is Say's footnote.

James Mill, on the other hand, makes a statement typical of many which were to follow, and which might be used to defend the view that most of the classics believed in Say's Identity : " When a man produces a greater quantity of any commodity than he desires for himself, it can only be on one account ; namely, that he desires some other commodity ".[1] Unless he here means money to be considered a commodity or unless, and this is a possibility we cannot rule out, he is assuming implicitly that the price level is adjusted to the quantity of cash, this would appear to imply acceptance of the identity. It is, of course, also possible that the problem did not occur to him.

If we compare this with McCulloch (who is sometimes considered the least subtle " classic ") it becomes clear that it is not entirely far-fetched to argue that James Mill's statement need not mean that he believed in the identity rather than the equation. Thus McCulloch first argues very much like Mill, only more specifically excluding money :

> " It is, however, the acquisition of [other commodities] . . . and not of money, that is the end which every man has in view who carries anything to market ".[2]

and argues that therefore the redundance of individual produce must occur because production is misdirected and " is independent of the value of money ". However, he at once makes it clear (and repeats this point in detail on the following page) that this is only a long-run equilibrium statement and is so *because the value of money has had time to adjust to the quantity* :

> " It must, however, be borne in mind, that in the previous statements we have taken for granted that the value of money . . . has been invariable, or that, at all events, it has not been sensibly affected by sudden changes in its quantity and value. These changes may, as already stated, exert a powerful influence ; and have frequently, indeed, occasioned the most extensive derangement in the ordinary channels of commercial intercourse . . . any sudden diminution of the quantity, and consequent rise in the value of money . . . may be such as materially to abridge the power of the society to

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[1] [26], p. 222.

[2] [21], p. 217.

> make their accustomed purchases, and thus to occasion a glut of the market ".[1]

Could there be a more forceful rejection of the identity ? J. S. Mill, in the *Principles*, speaks similarly of the " under-supply of money " during a commercial crisis,[2] this again in connection with a discussion of Say's Law, and after having just made the statement (quoted by Keynes in the *General Theory*) that " All sellers are inevitably, and by the meaning of the word, buyers " etc.[3] But the clearest statement on this point is that in J. S. Mill's second essay in his *Unsettled Questions*. We shall offer no quotations from there—it must be read *in extenso*. It is all there and explicitly—Walras' Law, Say's Identity which Mill points out holds only for a barter economy, the " utility of money " which consists in permitting purchases to be made when convenient, the possibility of (temporary) oversupply of commodities when money is in excess demand, and Say's Equality which makes this only a temporary possibility.[4] Indeed, in reading it one is led to wonder why so much of the subsequent literature (this paper included) had to be written at all.

It thus appears that the classics may have been taken too literally by Lange and Patinkin. As was the case in other connections, some of the classics may simply not have considered it worth the effort to point out that they were speaking about long-run equilibrium tendencies. Certainly the cases cited lend support to this view, and we have not found a " classic " who was explicit to the contrary.

The case of Wicksell is also particularly interesting in this connection because of Lange's comments. Lange himself points out that Wicksell (in our terminology) was driven to reject Say's Identity in favour of the Equality. After pointing out how Wicksell was forced to abandon the Identity in order to establish any monetary theory at all, he states,

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[1] *Ibid.*, pp. 218-219. The unabridged passage is even more forceful. He adds, " It is almost unnecessary to lay any examples of what is, unfortunately, so common before the reader."

[2] [28], Book III, Chapter XIV, Section 4.

[3] *Ibid.*, Sections 2 and 3.

[4] [27], pp. 46-74, esp., pp. 69 ff. Mill remarks (p. 74) " . . . these well-known facts . . . were equally well known to the authors of the doctrine (Say's Law) who, therefore, can only have adopted from inadvertence any form of expression which could to a candid person appear inconsistent with it ".

Note that on p. 71 a general fall in commodity prices decreases the demand for cash not through the transactions demand, but via the expectation that the price fall will not be permanent.

> "He finally appeased his conscience by stating that total demand and total supply must be equal only 'ultimately' but may differ 'in the first place'. With this observation Wicksell, and with him all monetary theorists, gave up Say's law by substituting for the identity an equation which holds only in equilibrium. . . . But this tendency toward equilibrium . . . should not be confused with Say's law."[1]

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The Evaluation of Federal Grants[1]

By A. D. Scott

I

The financial problems of federalism arise whenever the authority for collecting taxes and receiving other revenues differs from the authority constitutionally charged with dispensing services. They arise most obviously in the five federal members of the Commonwealth, the United States and Switzerland, to mention only the best known examples in the Western world. On a different scale, however, exactly analogous central and regional situations appear wherever local government is financially aided from the national revenues. In the United Kingdom, for example, the average county raised barely 40 per cent. of its total expenditure from local sources, while more than 60 per cent. was received from national grants for specific purposes and for general expenditure.[2] The political dangers of such close dependence on senior legislatures are obvious, and it will be difficult to prevent the localities becoming purchasing and spending agents for the various ministries if the national share becomes larger.

There is a third sphere wherein federal finance will bear close attention. The projected unions of colonies in Central Africa and in the West Indies will inevitably need to make constitutional provision for the restitution of revenues lost when local tariffs are abolished, from the new central customs to the local treasuries. How are such transfers to be made ? Every system which can be evolved implies arbitrary assumptions about the satisfaction of local rights and local needs. This tariff-transfer problem is, however, merely the customs-union stage of federation. A true federation will need a central taxation system to pay for administration, defence, and national capital development projects, while more local government services will need more local revenues.

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[1] Mr. H. G. Johnson has read the paper, and made numerous useful criticisms. His suggestions have been particularly fruitful in Part III.

[2] The proportions for county boroughs were closer to 50—50. See the exhaustive county-by-county analysis of Tables IXA and IXB, pp. 248–251 in L. T. Little *et al.*, " The Effects of the Local Government Act, 1948, and other recent legislation on the finances of local authorities ", *Accounting Research*, II, 3 July, 1951.

If some localities are poorer than others, so that the standards of their local services (such as health, education or relief) are substantially below the national average, or if the tax system is designed so that one level receives less than it needs, the real complications of federal finance emerge. It appears certain that the first of these difficulties will afflict both Central Africa and the West Indies.[1]

While some interest has been shown in the customs unions, it has been chiefly the administrative difficulties that have been tackled.[2] There is, therefore, a great need for investigation in advance of the financial arrangements between centre and region, so that systems which involve obvious inequity, undesired loss of local independence, or the frustration of the gains from rationalisation of the economy can be avoided. It appears that the earnest researches of the Australian and Canadian commissions have been disregarded, so that once again the declining position of some of the provinces after federation will take the young legislatures by surprise. It is far too easy to right such disparities by making federal grants which in many of their effects resemble the borders which have been swept away. It may well be that the maximisation of the real gross national product and the equalisation of regional standards of living are incompatible.[3]

However, the purpose of this paper is to provide a method of analysing the satisfactions received from methods of making federal grants, for the difficulties of the long-run maximisation of the national product are as nothing compared with the mysteries of the maximisation of satisfactions. While production has an objective, or at least a money counterpart, the measurement of satisfaction comes up against many obstacles, not the least of which, in the case of federal finance, is the absence of any indication as to whose satisfaction should be maximised. We can, for a while, avoid this issue while analysing possible situations, but must return to it at a later stage. As in the 1950 "Note," we shall use the words 'province', 'state' and 'local' interchangeably; and we shall designate the main body as the 'general', 'federal' or 'central' government. Both levels of government provide 'services' and 'amenities', which mean the same thing.

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[1] Barbados, Jamaica and Trinidad, for example, may well have to make net transfers to the weaker colonies, while Trinidad will probably benefit from an enlarged tariff-protected market. See *The Economist*, Oct. 6, 1951, pp. 811–12. The differences in the economic maturity of the Central African units are even more marked.

[2] See *Report of the Commission on the Establishment of a Customs Union in the British Caribbean Area 1948–50*. H.M.S.O., 1951; and *Central African Territories: geographical, historical and economic survey*. Cmd. 8234, 1951. See also Viner, J., *The Customs Union Issue*, London, 1950, for an enlightening study of the economics of customs unions from the point of view of trade and income creation.

[3] Scott, A. D., "A Note on Grants in Federal Countries," *Economica*, 1950, pp. 416–422. Cf. Keirstead, B. S., *The Theory of Economic Change*, Macmillan, Toronto, 1948, p. 336, and Chapter XV *passim* for a contrary view, and Buchanan, J. M., "Federalism and Fiscal Equity", *American Economic Review*, 40, 1950, pp. 583–599, for a different long-run approach. A recent excellent report on Africa is S. Phillipson, J. R. and U. K. Hicks, *Report of the Commission on Revenue Allocation*, Nigeria, 1951.

If the grant is 'conditional', the implication is that it is to be used only for the purpose specified, and the details of the service are to conform to certain universal standards for the provinces set by the central parliament. Furthermore, it is almost always specified that the grant is made on condition that the province shall 'match' it, or a certain fraction of it, from its own revenue resources. To give a complicated example, in the United States' social security old-age assistance scheme, three-quarters of the first twenty dollars of pension has been provided by the federal government, and beyond twenty dollars the federal government matches the state's contribution to a maximum pension of fifty dollars. If the pension is greater than fifty dollars the entire difference must be made up by the state.[1]

The particular virtue claimed for conditional grants is that the taxing authority—the central government—is keeping the responsibility for the spending of the taxes: 'the old theoretical ideal that each unit of government must raise the revenues necessary for all the functions which it administers. . . ."[2] If we imagine the central government to be a maximising body, then the power to stipulate the use of grants made to the provinces will enable it to maximise the satisfactions obtained from spending the revenues it has collected. Handing the grants to the provinces *un*conditionally, on the other hand, removes from the control of the central parliament, which is responsible to all the taxpayers, the method of spending the amounts collected.

Unconditional grants, on the other hand, have claimed for them different virtues. Although constitutional and efficiency criteria suggest governmental income transfers from the centre to the state, there remains the argument that conditional grants " interfere with the right of the State to decide by itself what service it shall perform . . . (they may) stimulate a service which would not otherwise have been performed and for which money would not otherwise have been raised by the States ",[1] and the cautious Rowell-Sirois Commission in Canada commented, in 1940: " The Dominion in respect to conditional subsidies had to impose either such rigid and detailed conditions (often unsuitable to local conditions), involving such minute inspection and regulation as to be a major infringement on provincial autonomy and practical only in a unitary state, or general conditions which were only nominally observed and no real check on any irresponsible expenditure ".[2]

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[1] Cf. *Social Security Bulletin*, Sept., 1946, pp. 2–8 and 25–30; *Social Security Yearbook*, 1947, p. 63; and Cohen, W. J. and Calhoun, J. L., "Social Security Legislation", *Social Security Bulletin*, July, 1948, pp. 3–14.

[2] Hansen, A. N. and Perloff, H. S., *State and Local Finance in the National Economy*, New York, 1944, p. 123.

Professor Simons, in his summary of the United States income tax policy has said : " First of all, the federal government must eschew arrangements which would enable it, through the distribution, to influence state and local policies (except perhaps in matters of income and inheritance taxation). Conditional grants-in-aid are unobjectionable so long as they involve only modest contributions to worthy causes. Such devices are totally undesirable, however, in connection with distribution of the magnitude here in question."[3]

Unconditional grants, on the other hand, put income into the hands of the provinces so that they can reduce taxes and provide the present standard of services, provide further amenities without increasing taxes, or increase both taxes and amenities.

In most countries both types of grants are now used. Constitutional provisions in the United States, by preventing the federal government from promoting certain services directly, have forced it to use conditional grants widely, and for reasons connected with the transformation of the Poor Law administration into the present social services, the largest part of English local government grants are for specific expenditures.[4] In Australia and Canada constitutional commitments have dictated the use of an array of unconditional grants and subventions (which we shall also call ' lump sum ' grants or ' block ' grants).[1]

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[1] Somers, H. M., *Public Finance and National Income*, Blakiston, Philadelphia, 1949, p. 461.

[2] *Report* of the Royal Commission on Dominion-Provincial Relations, Book II, p. 127.

[3] Simons, H. C., *Personal Income Taxation*, Chicago, 1938, p. 216. The Rowell-Sirois Commission, *loc. cit.*, and Dr. M. Newcomer, in *Taxation and Fiscal Policy*, New York, 1940, pp. 53–54 show, however, that even conditional grants may lead to local spending programmes totally at odds with the intentions of the central legislature.

[4] Cf. Little *et al.*, *ibid.*

II

We hope in this part to make explicit the matters involved in discovering whether a conditional grant is likely to override the preference of a province in spending a given expenditure. Specifically, the method is an adaptation of the indifference curve analysis of Messrs. Peacock and Berry of the relative advantages of specific subsidies and income subsidies.[2] For a federal grant is analogous to a subsidy; it can be used to augment individual incomes (budgets) or to cheapen certain products (services). The redistribution which can be brought about is of three kinds: (*a*) from rich to poor throughout the federation, regardless of province, through the action of the federal income tax; (*b*) from rich to poor within the province, through the combined effect of the reduction of dependence on provincial regressive taxes and the larger grants for social services; and (*c*) from the wealthier provinces to the poorer provinces. Here we are speaking of the third type of redistribution.[3]

The chief objection to indifference curve analysis in such research is that the redistribution being studied brings about a change in the shape and position of the indifference curves being used. The subsidy paper of Peacock and Berry managed to avoid the perilous question by examining instead changes brought about in the condition of the individual income receiver instead of in the condition of the economy as a whole. That course could not be followed here, for we cannot easily assume a ' representative citizen ' when we are discussing income redistribution through social services. A second course would be to regard our indifference curves as belonging to the legislature of the province, which could be expected to have majority preferences with respect to the burden of taxes and type of service. This idea is not acceptable if we believe the preferences of legislatives are fleeting and ephemeral and have no long-run utility significance. It is acceptable, however, if we believe the legislature does satisfactorily reflect community opinions ; in fact it is a very useful method of avoiding the question of interpersonal utility comparisons, for we can assume the legislature has authority to make judgments on the social welfare of different individuals. The third and final course would be to assume that the changes intended are small relative to the amounts of them desired, and/or that they do not bring about a significant redistribution of income. But it would be difficult to imagine any sort of government social expenditure having this last effect, for the redistribution of income is usually the purpose of federal-provincial grants.

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[1] It is interesting to note that in Jugoslavia the taxing and spending power is greatest at the provincial (" republic ") level. " Grants " are made, in this country, from the republics to the central government, cf. *Times*, 24 Jan. 1951, p. 7.

[2] Peacock, A. T. and Berry, D., " A Note on the Theory of Income Redistribution ", *Economica*, 1951, pp. 83–90.

[3] The analysis of (*a*) and (*b*) is the analysis of income redistribution in the usual, unitary state, sense.

We are left, then, with either the second or the third view of indifference curves. In the case of the third, we must assume very small income changes, so that income redistribution does not make any person worse off. The second view is obviously the most convenient, and roughly accords with the views of authorities on this subject who have written about 'provinces' and 'states' rather than citizens and representative taxpayers.[1]

It should further be emphasised that while the diagrams will only show indifference between two alternatives, there are here choices among at least three alternatives of importance : between personal income (or its loss by taxation) and the quantity of government services in general, and between government services in general and the quantity of services of the amenity favoured by the federal grants. If we use taxation and federally-sponsored services on the axes, then the enjoyment of other provincial government services is implicit in the indifference curves. A slightly easier way to look at the matter is to put on one axis the quantity of service A, on the other the quantity of service B, and put into the indifference curves not only the utility of having these amenities, but also the dissatisfaction of the taxes necessary to pay for them. In the following diagrams we will use this second arrangement, except that we have been forced to leave until Part III the effect of taxes on the indifference curves when considering income from extra-provincial sources. The curves thus show the attitude to dividing a given budget between two types of service.

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[1] Cf. " Note on the Indifference Curves " at the end of this paper.

In Diagram 1 the curves are drawn showing the collective attitude of the province to the provision of varying quantities of A and B. A, shall we say, includes sanitation, public works, police and justice, and housing expenditure. The number of units of all of them can only by measured in terms of money. The distribution of expenditure among them is assumed to be optimal.[1] B, on the other hand, represents expenditure on a service not willingly undertaken by the province, say, unemployment expenditure. As in such diagrams, the sloping line represents by its position the tax income of the provincial treasury—its budget—and by its slope the relative costs of providing the two types of services. The point of tangency shows the distribution of expenditure between A and B in order to achieve the greatest community satisfaction.

The first conditional grant to be considered is the simple ‘ matching ’ case (Diagram 2). It is directly analogous to the subsidy on a commodity. Where before 100 persons could receive relief, now 110 can, and with the same *provincial* outlay. With the tastes depicted in the curves, the result has been that the province has received more of both services, and has moved to curve *b*. But by the usual reasoning it could be shown that the same total expenditure by the province aided by central government *un*conditional grants could be more efficiently spent, so as to touch curve *c*, with less of service B, however. In fact, while it is not certain that after the subsidy more will be spent on B (owing to the action of income and substitution effects), it is true that a conditional grant will lead to more being spent on B, and less on A than would be the case if the province had been given a block grant. In both cases, the province will be on higher indifference curves but the highest will be reached with the grant in unconditional form.

The next case (Diagram 3), however, is more complex. Here we portray a conditional grant of the following type. The federal government contributes nothing till the provincial government has contributed £50. After that, the federal government will match the £50 and each additional contribution from the province. This *type* of conditional grant is found in the dominion-province old age pension system in Canada and in the United States scheme outlined

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[1] We could equalise the marginal rates of substitution between all types of government expenditure, taken two at a time, and between them and tax-free income. The assumption that A represents an optimal distribution implies that these choices have already been made.

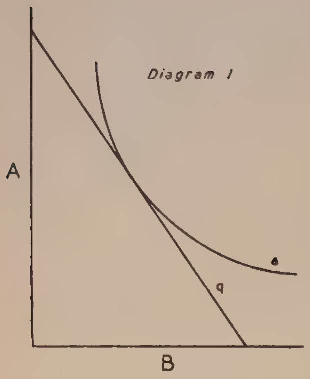
Diagram 1

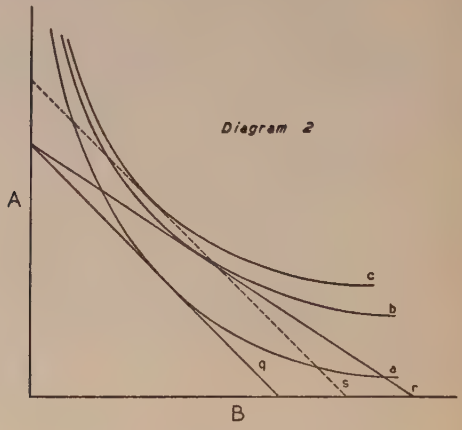
Diagram 2

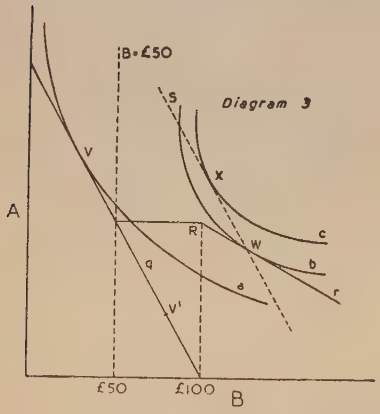
Diagram 3

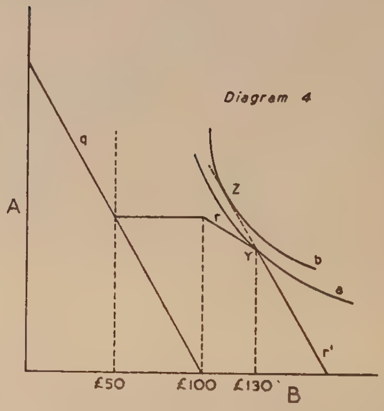
Diagram 4

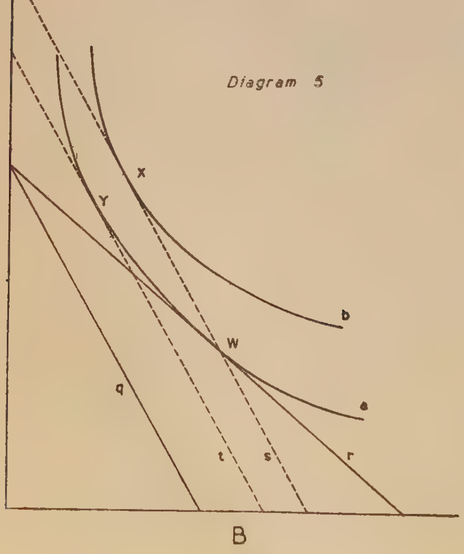
Diagram 5

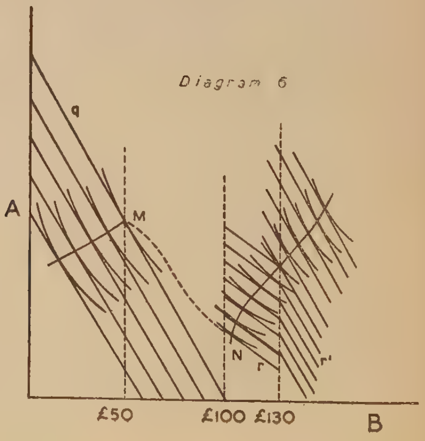
Diagram 6

above. The cost-line *q* touches the highest indifference curve *a* at V. It should be noted that V may well be below the point where *q* cuts the £50 line, at V′ on diagrams 3 and 10.

However, the same total expenditure, if devoted more to B and less to A, would enable the province to cross the £50 threshold and move immediately out to curve *r* which has twice the slope of *q* (to signify that the federal government is matching local expenditure) and also has its origin at B = 100. The indifference curve to which *r* is tangent may or may not be in the segment from B = 100 to the B axis. If it is, then the expenditure on A and B will be set at those coordinates. If not, the point R is the most advantageous position. Let us call this point W, on *b*. As in the previous analysis, there will be some more advantageous point than W involving the same total expenditure which could be reached if the grant were unconditional rather than conditional.[1] *s* shows the original cost relationship, and the new tangency point is at X, on *c*.

Diagram 4 shows the same type of conditional grant, with the condition added that after its contribution has reached a certain figure, say £65, the federal government will contribute no more, i.e. when the total expenditure reaches £130, the original cost relationship again holds, if the province continues on its own to spend on B. This introduces a kink into the line *r*, so that *r* and *r*′ may easily not be tangent to any indifference curve but cut them only at their intersection, say Y. Then Z, on *b*, would be a more desirable position.

If it were true that most provinces were led by this system to extend themselves to make full use of the federal grant, then their indifference curves would probably be steeply sloped and touch *r*′ beyond Y. If the point of tangency is beyond Y, along *r*′, the result is the same as with a block grant, for *r*′ is parallel to *q*. In fact, U.S. experience with the old-age pension scheme has shown the states spread all the way along *r*, with the average state at a position to the left of Y.[1] Thus it cannot be said that the federal government is urging and helping the States to do things which they would be only too glad to do for themselves.

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[1] There is an exception to this. In Diagram 10 we draw two indifference curves *a* and *b* touching *r* and *q* respectively. (If the slope of *r*, say, is greater than twice that of *q*, *a* can touch *r* at W, say. If it is less than twice the slope of *q*, *a* will touch the extreme R.) Then the province would prefer to be at V *without* the grant than at R or W with it. The province might accept a matching grant because it was free, maximise its satisfaction at R, or W, then find it would have been better off with the old distribution of expenditure *without* the grant. This situation could not arise if V were below S at V′, or if the grant were unconditional in which case the federal grant will inevitably increase satisfaction.

In all the above cases there is an alternative method of statement. It may be our desire, not to maximise satisfaction with a given expenditure, but to minimise outlays while achieving certain standards of satisfaction. The indifference curve approach to this is to be seen in Diagram 5, where we see, analogously with the tax-and-subsidy demonstrations, that the satisfaction to the provincial residents shown by *a* could be achieved with a smaller total expenditure by giving an unconditional grant *t*, than with the conditional expenditure *r* which is equal to *s* and greater than *t*. Hence the least expensive way of reaching a given standard of satisfaction is through an unconditional grant.

III

As we mentioned in Part II, it is not possible to show the three variables taxes, expenditure A and expenditure B on the same diagram. The utility surface, therefore, and the indifference curves, showed community choices between the two services, with the amount of taxes needed to finance them being treated as given. The reason is as follows. The system of curves shown makes the assumption that as more of the two services are enjoyed by the province, the total satisfaction rises. This attitude to the *receipt* of services seems fairly realistic. But we cannot assume that the attitude to the *payment* for the services is such as to cause the satisfaction from services *minus the dissatisfactions from taxes* to increase. It may well be that taxes are so distasteful that having more of the services and paying for them may cause a loss of total satisfaction.

It is possible to justify the course of action taken in Part II by assuming that (*a*) the outlay of the province is more or less determined by the ability of the citizens to pay indirect taxes, which are the usual source of provincial revenue and (*b*) the taxes which the general government must collect in order to make grants to any given province are small relative to the level of taxation which already exists there. Hence it may be broadly true that there is a system of utility curves which is independent of the level of taxation, especially if the two services being considered will absorb only a small part of the provincial budget.

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[1] Cf. Maxwell, J. A., *The Fiscal Impact of Federalism in the United States*, Cambridge, Mass., 1946, p. 128.

Such a justification, however, has the result of leaving us unsure as to what the actual attitude of provinces will be to the grants offered to them. Just as in value theory the indifference curve technique yields an income-consumption curve, but does not tell us what the consumer will actually spend on each of the two commodities, the analysis of Part II tell us how the province will dispose of a given revenue from all sources, but does not tell us how many of the services it would actually buy when it has to pay taxes. In value theory this is handled either with demand curve analysis, or with the theory of the choice between income (and/or taxes) and leisure. We propose here to adopt this latter method.

If we consider Diagram 3 we can replace the point of tangency V on line *q* with a series of such points, traced by the emergence of the expenditure lines from the origin, showing steadily greater taxation and purchase of the two services. This is seen in Diagram 6. The 'budget-expenditure' curve is the locus of points of tangency of steadily greater budget lines with more remote indifference curves. (These curves need not be consistent with one another. Each budget probably has its own family of indifference curves, showing the effect of the new distribution of income brought about by the method of taxation. We have drawn them as one family of curves for convenience only.) We have exaggerated the effect of a matched grant in the diagram ; which therefore shows a great discontinuity in the amount of B purchased. Steadily greater expenditures by the state, shown here by the continuing lines parallel to *r*, do not show further leaps, for the federal government will only match expenditures on B. The lines parallel to *r′* show the budget lines *after* the federal limit has been reached.

The next diagram, 7, shows indifference between taxation and expenditure on government services, A+B, the distribution of expenditure between them being optimal. These curves reflect several provincial attitudes. One is the result of the wealth or income of the citizens, that is, its taxable capacity. In the diagram, taxable income is measured on the vertical axis, and the total quantity of services A+B purchased and dispensed by the local government shown on the horizontal axis. Taxes are measured downward from the point Y on the income axis, indicating a deduction from taxable income. A state with a small taxable capacity will have a system of indifference curves relevant to its income, measured on Y, which are relatively flat, showing increasing satisfaction with increasing income, but having a very low marginal rate of substitution between income and government services.

Another provincial attitude which is reflected is the attitude to the provision of services by the government rather than individually. A community of individualists would presumably have the relevant position of its indifference map shaped like one with low taxable capacity. On the other hand, if our population desires a welfare state, the marginal rate of substitution of personal income for government services will be high.

The other curve in Diagram 7 is an opportunity curve, showing the amount of government services, of the two types A+B, which we will assume to exhaust between them *all* but the Smithian[1] minimum of government services, which can be purchased and dispensed by the government with the sacrifice of the taxed income (measured from Y toward O) shown on the vertical axis. The constant amount of taxes Y T shows the minimum amount of taxes which must be paid for the minimum of services mentioned above. The curve then curves down toward the A+B axis. If it is concave to the origin it shows that as the provision of government services increases, the administration of them absorbs a greater proportion of the outlay, and there are ' decreasing returns '. A straight line indicates that the administrative expense is a constant percentage of each pound of taxes collected. It has a 45° slope, if we neglect administration expenditures and measure income, taxes, and A+B in money terms. The analysis pictures the province choosing that combination of taxes and services which will place it on the highest indifference curve. In Diagram 7, then, the point of equilibrium is at X, where taxes are Y T + T Z and spending on A + B is O W.

The T T is an opportunity curve calculated from M in Diagram 6, showing a continuous exchange of taxes for services. But if we assume that the kink M N in the curve of government expenditures indicates a distortion of the

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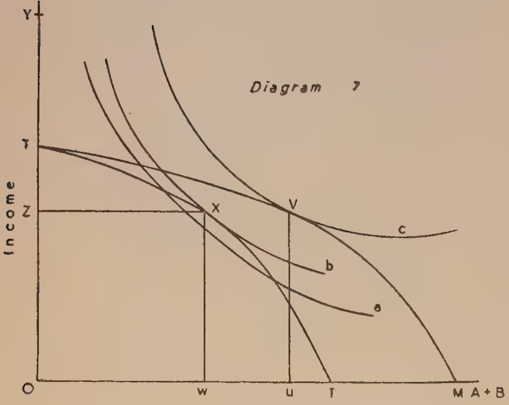
[1] *Wealth of Nations*, Book 5, Chapters 1–5.

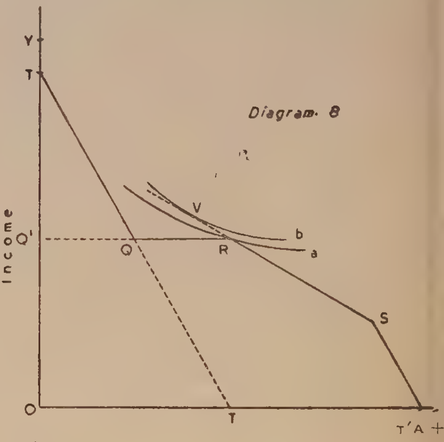
state's plans for total spending on A+B, then the shape of T T will also show a change of shape. This we show in Diagram 8. Here the opportunity line after jumping to R, shows a sharp change of direction. At Q the availability of federal matching grants for service B makes the sum total of A+B available for Y Q′ taxes considerably greater than Q Q′, and Q′R is now available. The segment R S represents the segment N in Diagram 6. The slope is less, suggesting the greater cheapness of services to the province.

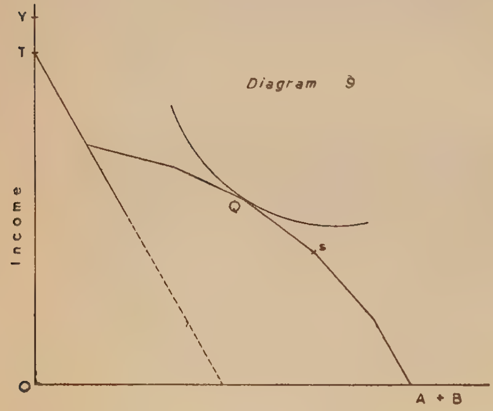
If T T is 45° to both axes, R S has a slope greater than 45°. If there is a top limit to the bounty of the federal grants, the final shape of the opportunity line is as ST′, where the slope is practically what it would be without the subsidy, though the fact that there was a subsidy will change the efficiency of the administration and the slope will not be as in the base of T T in Diagram 7. We would expect, from the fact that most states make some use of the services helped by central governments, that the tangency points of the curves will lie along R S or S T′.

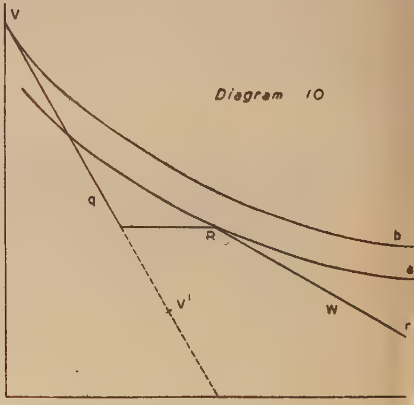
Curve *a*, however, shows a situation typical of a poorer state which, having made the extra taxing effort to match the federal grants, has attained the position R, which is a more desirable position than anything which would have been tangent to T Q or its extension toward the A+B axis. Here the state is paying Y Q′ in taxes and receiving Q′R in services. Q′R is probably the national minimum of services which the federal government is prodding each region to provide. It should be noted, however, that because of the large discontinuity in T Q R S T′ as drawn, this state is not as well off as it might be, if it paid a *smaller* tax bill, and bought fewer services (any position N.W. of R), as can be seen at V, where the same federal matching of a smaller state contribution touches the higher curve *b*. The same possibility exists in the area N.W. of S, but this would imply the general government contributing more than the matching amount.

Here, then, is the second significance of the inefficiency of conditional grants. If the grant is of the type wherein the state expenditure must reach a certain sum before the federal contributions begin, the state may be beguiled into receiving more services and paying more taxes than they would wish to if they were offered a smaller subsidy, taxes, and fewer services. This difficulty could be overcome, graphically speaking, if the kink in T T could be replaced by a rounding off of the curve so that it will probably touch the highest indifference curves well along the A+B axis. The flatter curve would mean that (see Diagram 9) for small expenditures on B, and therefore on A+B, the proportion of the expenditure paid by the general government is high, while as the curve grows steeper it suggests that the grants provide a smaller proportion as the total expenditure by the state grows. Since small expenditures suggest poor states, and larger expenditures wealthier ones, we would expect the poor state to be tangent in the neighbourhood of Q, while the richer ones will be tangent near S. The actual equivalent of this graphic analysis was provided by the









Connally Amendment of 1940 to the American social security structure, which was expected to see that the contributions of provinces " would be matched at a higher over-all proportion in the poor than in the wealthy states, thus providing substantial equalization without encouraging 'disproportionate' spending for welfare functions by poor states ".[1] In other words, instead of a kink, showing the doubling of a certain minimum, a federal grant providing, say, two-thirds of the first fifteen pounds, one-half of the next ten pounds, and one-third of the next fifteen, is drawn as a line roughly following a smooth curve as in Diagram 9.

However, unconditional or block grants are of course still preferable to the province. This smoothing of the kink, which we have tried to approximate above, is a problem which can be avoided altogether by making A + B cheaper, thus moving T T to T M in Diagram 7, which touches *c* at V, and results in the purchase of O U services. For the total outlay of federal and provincial funds represented by the line T W, there is no more satisfactory position than V which the province can achieve.[2]

IV

Thus we have shown that conditional grants have two types of effects. The first is that a given total expenditure might give the province greater satisfaction if it were spent in different proportions than those to which the province is bound by the conditions of the grant. This is so as long as the grant is of the matching type, and does not depend on there being a minimum outlay by the state before the federal flow begins. The second is that if the grant is of the minimum-outlay type, and if the amounts in question are fairly large, the outcome may be the extension of taxation and spending by the state well beyond the point which would have been chosen if the state had freedom of action.

Here, however, we strike a very real difficulty. We have assumed that the province, or an aspect of it, is a maximising individual, which it certainly is—in some sense. But can it be said that it is *the* maximising authority ? In other words, are we asking the right question when we ask if the province is on its highest indifference curve ? The central government must be giving satisfaction to other taxpayers in other provinces in making the provincial grant. Ought we not then to examine next the utility surface of the federal community ?

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[1] Groves, H. M., *Financing Government*, New York, 1945, p. 530. The Connally amendment is assimilated into the old-age assistance scheme mentioned on p. 379.

[2] However, as in the footnote to p. 385, we must mention the exception to the above analysis shown on Diagram 10. If A + B are now shown on the horizontal axis, and income and taxes on the vertical axis, there may be a position V with lower taxes and fewer services preferable to R or W. A province which has committed itself to receiving federal aid may well find itself bound to a position which it cannot improve by small moves ,yet which is inferior to a position with no aid at all.

Many new difficulties appear if this is attempted. In the first place each federal taxpayer is also a provincial amenity receiver, and we would have to consider him in two roles, as local citizen, and as outsider making himself a grant. There will, of course, be a distribution such that most persons are grantors or grantees on balance, but the criterion need not be the taxpayer's province. The truth is that, even without this complication, we have here enlarged the problem of inter-personal utility comparisons to the grosser proportions of inter-community comparisons, which are correspondingly more obscure. In fact, at this stage we can learn much more from political theories of federalism[1] than from economists' theories of maximisation. Hence, taking our cue from Professor Robbins, we can only suggest that if it is the desire of the federal government to maximise the satisfactions of the provincial community, then it can probably do so more cheaply *or* more easily by making block grants than by making conditional grants. However, if the satisfactions of the central community are greater when the province spends its grants on (say) higher education than when it endows separate schools, and the order of the satisfactions of the province runs in the opposite direction, we have a deadlock welfare situation analogous to two points on a contract curve, about which very little of interest can be said by economists.

The conclusions that can be drawn are thus vague, as would be expected. Federal grants may indeed influence states to spend more than would be the case without their help, and will indeed sway their attitudes about the proportions of total expenditure to be devoted to each service. Each position chosen, is, however, a maximum in some sense. While it can be argued that the proportion that is selected is not the maximum position for that province that could be obtained with that outlay, it can be answered that the satisfaction to the federal taxpayers from the grant is greatest if the provincial decision is distorted in favour of the service chosen by the central legislature. The resolution of the deadlock cannot be achieved by economics alone.

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[1] Cf. Wheare, K. C. *Federal Government*, Oxford, 1951, pp. 259–260.

Note on the Indifference Curves

As mentioned in our discussion of the " community indifference curves " used here, there are good reasons for rejecting the assumption that the changes contemplated do not involve deliberate redistributions of income. This at once places our problem outside the purview of that portion of welfare economics which has developed the Kaldor compensation principle, the de Scitovsky double criterion, and further arguments leading to an unambiguous definition of economic welfare. (See Kaldor, *E.J.*, 1940 ; de Scitovsky, *Review of Economic Studies*, 1941 ; Robertson, *Manchester School*, 1951). That approach to welfare involves the *possibility* of an income redistribution after an economic change so that the sufferers would be as well off afterwards as before while the winners, after recompensing the sufferers, still enjoy improved welfare. Now our problem can be treated in this way as long as it involves only the choice between accepting or rejecting a federal grant, which then is similar to an increase in real income. But since the problem also involves the ways of spending the grant, which clearly leads to a redistribution of income, the community indifference curves may cross and give us no indication as to desirability of contemplated changes. (See Baumol, *Review Economic Studies*, XIV (1) and XVII (3), and Stolper, *Schweizerische Zeitschrift für Volkswirtschaft und Statistik* for discussions of these curves and their construction.)

It therefore appears that in discussions of Public Finance, it is not possible to avoid interpersonal comparisons of utility, as was indeed ceded by Mr. Kaldor to Professor Robbins in his paper mentioned above. Mr. Little has recently gone to some trouble to point out that value judgments about the distribution of income are always necessary, even in the first class of cases, and there has recently been a discussion between Mr. Henderson, Mr. Little and Mr. Buttrick (*Review of Economic Studies*, XVI (1), XVII (1) and XVIII (3)) which, while recognising that ends *could* be selected by anyone, or in any way, has, at least in the papers of Mr. Henderson and Mr. Buttrick, investigated the rights of the Cabinet to do so. Earlier, Bergson's "Reformulation of certain aspects of welfare economics" (*Q.J.E.*, 1938) had stressed the importance of value judgments about the sharing of national income in constructing an economic welfare function. In other words, where it is intended to redistribute income, it is essential that interpersonal comparisons be made.

In the curves used in this paper this unpalatable task has been assigned to its customary performer, the state and provincial legislature. The choices are those of the members, acting together, not of the whole economy. Moving to a higher indifference curve means greater satisfaction to this body, not to the community at large. To the extent that the legislature is out of sympathy with all or part of the community, choices made on the basis of majorities, large or small, will be different from those which would lead to greater economic welfare. This is a regrettable defect of the analysis, but after all little more regrettable than that legislatures do exist which do not reflect the popular will or act in its interest. It should be emphasised, however, that even if the legislature is in close contact with the electorate, the duty of making interpersonal comparisons will still remain, and hence moving on to a preferred indifference curve in the above analysis may well make some persons worse off, without possibility of redress.

London School of Economics.

A Note on Railway Constructional Costs 1825-1850[1]

By Harold Pollins

"The capital accounts of to-day are heavily loaded with what some regard as the blackmails of the 'forties, and in international comparisons of costs Great Britain notoriously suffers through the heavy initial outlay in lands and parliamentary expenses to acquire them against bitter opposition". So wrote Sir Josiah Stamp in 1928.[2] 'Blackmails' is perhaps a strong word but a good case can be made for its use when the details of the difficulties that early railway companies had to overcome are considered. But although it can be shown that landowners were paid handsomely for land sold to the railways, it does not follow that this expense was of the order of magnitude that contemporaries and recent writers have suggested. The argument[3] is that the opposition to railways in this country, the difficulties of obtaining Acts of Parliament, and the high prices paid for land, sometimes under duress, adversely affected the railways' capital accounts to a significant degree. In this note the statistics of capital expenditure of a number of railway companies will be examined to see what proportion of their expenditure went on obtaining Acts of Parliament and on purchasing land.

I

That existing transport undertakings should oppose the emergence of a lively rival with important technical advantages is understandable. So are the feelings of exasperation of those landowners whose estates were to be spoilt; any large-scale building operation involves temporary confusion and spoliation, and the raw embankments and cuttings must have given the appearance of unnecessary destruction. "Is there no nook of English ground secure From rash assault?"

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[1] The research on which this paper is based was made possible by grants from the University of London Central Research Fund and University College, Leicester. I have to thank the British Transport Commission for the use of material, both MSS. and printed.

[2] W. V. Wood and Sir Josiah Stamp, *Railways*, 1928, p. 12.

[3] See C. E. R. Sherrington, *The Economics of Rail Transport*, 1928, I, pp. 16, 28. J. Francis, *A History of the English Railway*, 1851, *passim*. H. Spencer, *Railway Morals and Railway Policy*, 1855, *passim*.

asked Wordsworth,[1] voicing the thoughts of many to whom the railways were offensive, even though the offensiveness lay more in the " novelty and the rawness of the great new railways ".[2]

Opinions alone, however, do not enter into balance sheets. It was when such people as Creevey could involve the railways in extra expense by opposing and defeating Bills in Parliament that antagonism became translatable into financial terms. Writing to Miss Ord in 1825 Creevey complained of " this infernal nuisance—the loco-motive Monster ", and on the day of the Bill's defeat he was overjoyed. " Well—this devil of a railway is strangled at last. . . . Sefton's ecstacies are *beyond*, and he is pleased to say it has been all my doing : so it's all mighty well ".[3] Similarly Maurice Swabey who objected to a proposed line from London to Windsor in the early 1830's on the grounds that " . . . we shall have a daily importation of all the ladies from St. Giles's, and the thieves from Seven Dials. . . . "[4] was manifesting the kind of fear (not altogether misplaced if he was thinking of the navvies) and opposition which could have important effects on railway history.[5]

Indeed, Sir Herbert Maxwell, the editor of the Creevey papers and other private correspondence, suggests that : " those who have given attention to the private correspondence of this period must be familiar with the expressions of horror and passionate remonstrance directed against the various schemes of railway construction which were being promoted ".[6] He quotes a ' fervent petition ' from Jane Porter to her brother, Sir Robert Porter : " I will not allow this to go without expressing to your friend Lord Clarendon through you, your antiquarian Sister's horror at the rumoured projection of a *rail road* thro' this most interesting domain of Kenilworth ! ! ! I pray you beseech him, by the shades of all the venerable and noble and beauteous memories thereunto belonging, that he will not allow it to be so desecrated. Our Henrys—our Edwards, with their royal trains, their princely huntings and their knightly jousts—our queenly Elizabeth with her court of heroes, gallant and poetical—her maidens, fair as her virgin self; and Shakespear in the van and our own Walter Scott in the rear—all, all call out against the dire and wicked devastation ".[1] More particularly active opposition was of several degrees of importance; landowners might refuse surveyors access to their lands, and dukes were said to have " perilled the honour of their escutcheons in open fights with the general enemy "[2]

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[1] Quoted F. S. Williams, *Our Iron Roads*, 1883 edn., p. 34.

[2] Hamilton Ellis, *Four Main Lines*, 1950, p. 10.

[3] Sir Herbert Maxwell (ed.), *The Creevey Papers*, 1904, pp. 87–88.

[4] R. Cort, *Railroad Impositions Detected*, 1834, p. 111.

[5] See the arguments of those opposing the London and Birmingham Railway, in Joan Wake, *Northampton Vindicated*, 1935, p. 5 *et seq.*

[6] Sir Herbert Maxwell, *The Life and Letters of George William Frederick, Fourth Earl of Clarendon*, 1913, I, p. 166.

Again, a landowner might refuse permission to build a line through his estate, thereby forcing the company to make an expensive deviation.[3] Thus the inhabitants of Llanelly ' bitterly opposed ' the South Wales Railway, with the result that the railway was built on the outskirts of the town.[4] But more important than these minor irritations was the opposition which led to the presentation of petitions against the company's Bill and to lengthy considerations before parliamentary committees. The fees of counsel and the payments to witnesses (including travelling expenses and lodging expenses in London) mounted as the Bill was considered in committee. One professional witness complained in 1847: " The trade is not quite so good a one as it was two years ago, when any intelligent and thorough-going calculator of traffic commanded his own price, and therefore invariably stood at an exorbitant premium ".[5]

Not all railway contests in Parliament originated with the opposition of individuals or canal companies and other vested interests. The competition between rival railway companies was probably more important and more costly than the more frequently advertised opposition by landowners and others. It would be impossible to estimate the relative effects on parliamentary expenditure of these two kinds of opposition, but it would not be legitimate to place the whole blame on landowners, canal companies and obscurantists.[6]

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[1] Sir Herbert Maxwell, *The Life and Letters of George William Frederick, Fourth Earl of Clarendon*, 1913, I, pp. 166–167. Clarendon was the owner of Kenilworth Castle. This letter refers to the late 1830s. " Violent opposition," too, was met by the second proposed line between London and Dover in 1832 (the first was in 1824). C. F. Dendy Marshall, *History of the Southern Railway*, 1936, p. 378.

[2] Francis, *op. cit.*, II, p. 244.

[3] Williams, *op. cit.*, pp. 79–80, and S. Smiles, *Lives of the Engineers*, V, p. 239, for examples of such deviations.

[4] Sir J. E. Lloyd (ed.), *History of Carmarthenshire*, 1939, II, p. 390.

[5] " Letter from a Railway Witness in London," *Blackwood's Edinburgh Magazine*, Vol. LXII, July 1847, pp. 68–82.

[6] *Herapath's Railway Magazine* continually criticised the Parliamentary procedures; see, for example, July 1836, pp. 174–183. M.P.s could threaten opposition to a Bill by inserting

Lastly, there is the charge that landowners blackmailed the companies into paying heavily for land and compensation. The generally accepted story seems to be that some landowners, presumably those in strategic positions, demanded large sums for their land and for assurances that they would not oppose the railway's Bill. Thus Francis says: "The principle of buying off opposition assumed a variety of monstrous shapes. Sums of £5,000, £6,000, £10,000, £30,000 and even £35,000 were given ostensibly for slips of land but really to avert opposition".[1] Lord Petre of Ingatestone was reported to have entered into an agreement with the Eastern Counties Railway to withdraw his opposition on payment of £120,000[2] for land alleged to be worth only £5,000.[3] On the line of the Great Western, too, "noblemen were persuaded to allow their estates to be desecrated for a consideration".[4] Francis concludes that "every line in England has cost more than it ought" and the two main reasons were—land and compensation.[5]

In any case every landowner was obviously in a strong position for he could always demand more than the company was willing to pay, with the backing of a threat—implicit or explicit—of costly opposition and lawsuits. Even the smaller landowners could demand, not always successfully, large amounts for land and compensation. Mr. Manby of Stratford Grove demanded £4,347 15s. 0d. for "less than an acre of pasture"[6] while Mr. Husband claimed £1,200 for land assessed at £10 by a jury;[7] £873 only was awarded to the Glasgow Lunatic Asylum which had originally asked £44,000 from the Edinburgh and Glasgow Railway.[8] There

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onerous clauses, and would then approach the company and "... if the clauses would impose £5,000 expense, they would most disinterestedly undertake to remove them, for, say £4,000, which of course was a saving of £1,000 to the Company". *Ibid.*, 4 December, 1847, p. 1361.

[1] Francis, *op. cit.*, II, p. 173.

[2] *Ibid.*, I, p. 256.

[3] *Ibid.*, I, p. 259.

[4] *Ibid.*, I, p. 217.

[5] *Ibid.*, I, pp. 204–205. Williams, *op. cit.*, pp. 78–85, for a discussion on heavy payments for land to avoid opposition. W. T. Jackman, *The Development of Transportation in Modern England*, 1916, II, p. 499n, for further details.

[6] Eastern Counties Railway, Board Minutes, 14th November, 1836. A jury awarded him £565. *Ibid.*, 31st October, 1837.

[7] *Ibid.*, 31st October, 1837. *Herapath*, January 1838, p. 64, gives further particulars of similar cases—amounts demanded, £38,595; total awarded, £13,087. It also refers to two cases of the Eastern Counties Railway where £10 and £565 were awarded. These would appear to be those mentioned above; but the amounts demanded are different, being £1,156 (£10 awarded) and £1,436 (£565 awarded).

[8] Williams, *op. cit.*, p. 82. See also W. W. Tomlinson, *The North Eastern Railway*, 1915, p. 182, for further examples.

can be little doubt that, in general, landowners demanded, and very often received, more than the companies expected to pay. In most of the parliamentary inquiries of the 1840s and 1850s witnesses were not lacking to testify that "enormous sums of money"[1] had been paid to landowners. Even when landowners were less recalcitrant and became Provisional Committeemen it was primarily, we are told, to use their "influence to enhance the price of land they sold".[2]

Although it is not the purpose of this paper to examine these charges in detail it is clear that such generalisations about the actions of landowners are exaggerated and need modification. David Spring has already shown that many important landlords were favourable to railways.[3] A line in 1825 was proposed by some "Dumfriesshire gentlemen" who offered the land through which it had to pass without compensation.[4] Richard Eddleston eased some of the problems of the Grand Junction Railway by providing land in the early 1830s[5]; the London and Croydon Railway had little trouble in buying land.[6] And many of the landed colliery owners of the North East provided land and built railways, as did those at Barrow.[7]

Nevertheless, the charge remains, and it is not without some justification, that landowners were paid heavily for land. How much did the railways pay in the aggregate?

II

"Constructional costs" seems a fairly clear concept, but a closer examination shows that some clearing of the ground is essential before any conclusions can be reached. The ideal of course would be to have figures giving the total constructional costs of the railways with the proportions spent on the different components under the headings of land, parliamentary expenses and permanent way expenditure. But such statistics are not directly available. In the first place it is difficult, if not impossible, to define total constructional costs. In this note we are interested in the cost of building the actual line, and not in the stations, locomotives and complementary equipment, nor in the purchase of other lines and canals. Then, too, it may be emphasised that railways at no point closed their capital accounts, but continued to spend. Since, however, there was usually a marked slowing down in the rate of expenditure soon after the opening of the line, the procedure has been adopted here of using figures taken from the *Accounts* at a date within a short period after the completion of the individual lines.

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[1] *Report from the S.C. of the House of Lords* [*on*] *the Management* [*of*] *Railroads*, B.P.P. 1846, XIII, evidence of Pierce Mahoney of the Dublin and Kingstown Railway, Q. 378.

On the other hand, the compensation paid might be insufficient. The old synagogue in Canterbury for example, ". . . was expropriated in order to make the approach to the new station. Since it was held on lease only, the compensation obtained amounted to only one-quarter of the expenditure required to replace it. . . ." Cecil Roth, *The Rise of Provincial Jewry*, 1950, p. 48.

[2] Francis, *op. cit.*, II, p. 171.

Even those companies which rented land as 'wayleaves' instead of buying it were asked for high rents. See Tomlinson, *op. cit.*, pp. 214–216 and 224.

[3] David Spring, "The English Landed Estate in the Age of Coal and Iron: 1830–1880", *Journal of Economic History*, Vol. XI, No. 1, pp. 6–7.

[4] Tomlinson, *op. cit.*, p. 190.

[5] W. H. Chaloner, *The Social and Economic Development of Crewe*, 1950, pp. 19–20.

[6] *Herapath*, May 1837, p. 314.

[7] J. Melville and J. L. Hobbs, "Early Railway History in Furness", *Cumberland and Westmorland Antiquarian and Archæological Society*, Tract Series, No. XIII, 1951, pp. 13, 14, 21, 38.

The second difficulty is less easy to resolve. Since railway expenditure did not stop, and plans for future work beyond the completion of the line were still in hand, and since expenditure on some items—particularly land, but also rails—preceded construction, it is very likely that the figures for construction at, or soon after, the opening of the line would include items properly applicable to future work. If this was at all frequent the proportions for land and rails in the accounts would be exaggerated. But other expenditure too ought to be excluded ; land which was bought for brickmaking, or land bought and later sold should be allowed for ; so should the payments to contractors and landowners by debentures and shares. It is not always clear how these payments are included in the accounts—perhaps at the date of payment, or when the debentures mature, or perhaps they are ignored altogether.[1] However, it is unlikely that these difficulties are formidable, for the payments to contractors by shares were mainly a feature of post-1850 railway development.

A further problem remains, this time in connection with the figures themselves. Those used, whether from the Companies' *Accounts* or from Parliamentary Papers, were supplied by the companies. It is notorious that, even apart from primitive accountancy, frauds and scandals relating to railway accounts were made known in the late 1840s, when almost every railway company had its accounts examined by some sort of committee of inquiry. One parliamentary inquiry nearly resulted in the establishment of a Government Board of Audit.[1] The Eastern Counties Railway, which even before the advent of George Hudson had not a particularly happy experience, early found its accounts to be in an undesirable condition. In a reference to their balance sheet in 1839 the directors explained: "The verification of that Balance is necessarily deferred, from the difficulty which, notwithstanding the continued diligence of a skilful accountant is interposed by the perplexity and confusion in which the accounts were left by the late Secretary".[2]

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[1] Examples of such payments are to be found in the Minute Books of many companies. The following are extracted from the Finance Committee Minutes of the Great Northern Railway. 2nd August, 1848—payments for land by mortgage deeds, £3,000, £1,500, £750, and £750. Mr. Brassey, the contractor, paid by mortgage deed for £22,000. 31st October, 1848—mortgage bonds issued to the Marquis of Salisbury " in satisfaction of his claims upon the Company ".

Even a more reputable company like the Great Western encountered difficulties when amalgamations and purchases created confusion in the accounts. A contemporary opinion was that, "Attempts to define the ultimate capital of this company, considering the amalgamations, have proved futile. The many Acts of Parliament relating to it, and the involved powers have compelled the Railway Commissioners to declare it to be 'uncertain and not definable'."[3]

Lastly, two minor difficulties need consideration. The allocation of costs by the companies varied; thus 'Land' may include charges for compensation and conveyancing. But 'Law' may include conveyancing and costs properly applicable to parliamentary expenses. It is possible, too, that some of the expenses of 'Works' may have been entered under the heading of 'Permanent Way'; and so on. And many land purchases were made on the condition that 'accommodation works' would be provided. It would be legitimate to consider such works as compensation; almost certainly they are included in the constructional expenditure. How much they amount to is difficult to estimate; in any case, since contracts were made for whole sections of the line, it would be impossible to disentangle the detailed cost of such works.

However, despite the absence of certainty in regard to the figures, the conclusions which follow are legitimate, for the margin of error is unlikely to be so high as to reduce the analysis to absurdity.[1]

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[1] *S.C. of the House of Lords on the Audit of Railway Accounts*, B.P.P., 1849. X.

[2] Eastern Counties Railway, Board Minutes, 27th August, 1839. *Economist*, 1848, p. 825, ". . . accounts have been cooked by the Directors".

[3] *Bradshaw's Shareholders' Manual*, 1854, p. 155.

III

A fairly comprehensive set of figures relating to the cost of obtaining Acts (and other preliminary expenses) is contained in a Parliamentary Return of 1859.[2] Of the 263 companies from which a return was demanded, only 193 (73 per cent.) supplied details, and of these seven are incomplete. Of the 186 remaining companies, 159 showed that their preliminary expenses were less than 5 per cent. of their total outlay; 22 were between 6 per cent. and 10 per cent., and five between 11 per cent. and 20 per cent. As would be expected, those companies whose preliminary expenses were greater than 5 per cent. had only recently obtained their Act; their line was incomplete at the date of the Return. In time the percentage would fall.

These figures include expenditure on other items apart from the actual cost of obtaining the Act. 'Preliminary expenses' may include surveys, maps and the general costs of promotion. The proportion spent directly on Parliamentary costs was therefore lower than is shown above.[3]

Generally, therefore, we may conclude that the financial results of the difficulty of obtaining Acts were not important, and may be dismissed as an annoying interlude in railway financial history.[4]

LAND

Aggregate figures of land costs are found in various journals but are of little significance if the 'total cost' is not defined. Thus the *Railway Magazine*'s figure of 16 per cent.[1] in 1841 as the proportion of land to total cost may have little meaning; it compares with the 11 per cent. (£4,000 per mile out of an average of £35,000 per mile) or 15 per cent. (if the average cost per mile excludes expenditure on the Carrying Department, viz., £8,000 per mile) given by the *Edinburgh Review* in 1846[2]. Nor is Robert Stephenson's estimate of 25 per cent. of value for our purposes.[3]

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[1] No attempt is made in this note to compare expenditure with original estimates for the following reasons:

(*a*) The line as constructed seldom bore much resemblance to the original plan; many alterations and deviations were made.

(*b*) The original estimates may have been badly made. Very often speed in making surveys was considered more important than accuracy. (See Smiles, *op. cit.*, V, pp. 263–264, for a discussion of the short time available to G. Stephenson when making surveys in a 'mania' period.) Engineers, too, were fallible and capable of mistakes. (See Cort, *op. cit.*, pp. 154–177, for "Facts to Prove that Railway Engineers are not Infallible".)

Thus to compare an estimate with actual expenditure may have little significance. The analysis below of the London and Birmingham Railway's Accounts provides an example.

[2] *Return of all Parliamentary Expenditure incurred by Railway Companies in each Session, from their First Act inclusive to the End of the Session* 1857. B.P.P., 1859, XXIII.

[3] The figures supplied by railway companies may have been exaggerated. Referring to the Cheltenham and Tring Railway in 1838, *Herapath* seems to imply that the Directors' item of £23,738 for "engineering, law and Parliamentary expenses" may be too high—"the line was a very short time before Parliament". *Herapath*, January 1838, p. 64.

[4] The preliminary expenses of two unopposed companies were: Whitby Pickering Railway, £2,868 (Tomlinson, *op. cit.*, p. 231). Maryport and Carlisle Railway, £5,818. (*Reports and Accounts*, dated 12th February 1839).

Detailed figures for individual companies are therefore preferable, and in the table statistics of constructional costs are shown for a number of companies. In order to define expenditure on the constructed lines, columns 5 and 6 show the total expenditure less the costs of locomotives and stations, and the land costs as a proportion of this modified total. Not all the *Accounts* specify the expenditure on stations and engines and no allowance is made for them in column 4 in that case.[4]

The table shows that of the 27 companies examined only seven spent more than 16 per cent. of their total expenditure on land, fourteen spent between 11 per cent. and 15 per cent. and six below 11 per cent.[5] In aggregate terms the total expenditure of these companies (less stations and engines where applicable)[6] amounts to £50,173,947 and total expenditure on land equals £6,974,012, a percentage of 13.9.

IV

As a footnote to the foregoing analysis two companies are worth examining in more detail. The Liverpool and Manchester and London and Birmingham Railways are often cited as two significant examples of high costs and as having suffered from the opposition of landowners. It will be seen that costs were augmented more by the costs of works than the cost of land although the latter was admittedly greater than expected. Part, however, of the extra expenditure on land was due to the area purchased exceeding the estimate.

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[1] 1841, p. 848; quoted Tomlinson, *op. cit.*, p. 354.

[2] October, 1846, p. 491.

[3] Appendix to Smiles, *op. cit.*, 3rd edn., p. 529.

[4] The procedure of subtracting the cost of stations is not entirely satisfactory, for in all probability the cost of 'land' includes the purchase of land for buildings and stations.

[5] The percentages refer to Column 6 of the Table.

[6] Column 5.

The Liverpool-Manchester estimate at the time of its Act was £510,000[1] and eventual expenditure was almost twice that.[2] Land expenditure at 31st May, 1830, was £95,305 out of a total of £739,165. Henry Booth estimated that a further £80,835 (none for land purchase) would be needed to complete the line, making a total expenditure of £820,000. This would make the land costs, as a percentage of £820,000, equal to 11.6. Omitting stations and engines (£93,689; £51,689 up to 31st May, 1830, plus £42,000 further estimated expenditure) the percentage would be 13.1.

The second example is the London and Birmingham Railway.[3] In the estimate land costs were expected to be £250,000; eventually something over twice that was spent. But expenditure on other items increased as well. A convenient summary of this company's capital expenditure is found in the *Report of the Select Committee on Railways* of 1839[4]:

	Parliamentary Estimate.	*Expenditure to 31-12-38.*	*Excess.*
Land and Compensation	250,000	537,596	287,596
Works, Road and Stations ..	2,070,807	3,707,589	1,636,782
Locos, etc.	80,000	194,343	114,343
General (inc. cost of Act, £72,869)	99,193	208,676	109,483
Interest	—	102,931	102,931
	2,500,000	4,751,135	2,251,135

(A further £232,714 was spent on the extension line to Euston; but as this amount is not broken down it has been omitted.)

It will be seen that out of a total excess of £2,251,135, land accounted for 12.7 per cent., while works, roads and stations accounted for 72.2 per cent.

The London and Birmingham commenced operations with little trouble. In their *Report* dated 21st August, 1834, the Directors stated that they had little inconvenience in obtaining land, and only one case had had to be referred to a jury; contracts for the works on the first 42 miles to be constructed were very close to the estimate (Estimate: £601,342. Contracts: £604,161). By the next six-monthly *Report* (dated 13th February, 1835) contracts for 16 more miles had been let, making a total of 58 miles contracted for £850,444 against the engineer's estimate of £846,802.

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[1] *Report of Select Committee on Railways*, B.P.P., 1839, X, evidence of Henry Booth, Q. 721, "In our instance, it was not known what expense the railroad would be; we thought our estimate was very full when we took £510,000".

[2] The only capital accounts published are in H. Booth, *Account of the Liverpool and Manchester Railway*, 1830, p. 97. These, however, refer to expenditure up to 31st May, 1830, only, whereas the line was opened over three months later.

[3] H. G. Lewin, *Early British Railways*, 1925, pp. 22–23. See also Joan Wake, *Northampton Vindicated*, 1935, for a bibliography in connection with this problem.

[4] B.P.P., 1839, X, Appendix 17, p. 381.

For 86 miles the contracts were let for £1,311,502 compared with the engineer's estimate of £1,326,217.[1] By this date 1,293 acres of land had been acquired (two-thirds of the total) for £341,662.[2] By February 1836, all contracts, including those for the Euston extension, had been taken up for a total of £1,698,681; the engineer's estimate had been £1,732,965. Land was now expected to cost £550,000, a sum which was more than the original estimate because of the increased average cost and the larger area to be bought.[3]

The major increase in expenditure came after this, and relates almost entirely to the cost of works. The total cost was expected (in February 1837)[4] to be four-and-a-half millions, and was due to additions to the original plans, and to deviations, the extension to Euston and 800 extra acres of land. Land, too, was continuing to cost more than expected, partly because of the need to get land earlier than could be enforced under the Act. Rails were weightier and more costly; but apart from the Carrying Department for which extra Acts had been obtained, most of the excess was due to the difficulties of the contracts at Primrose Hill, Blisworth and Kilsby.

But this was not the end of the trouble. Robert Stephenson reported[5] that the embankments at Colne and Brent were subsiding; that there was an 'extensive slip' on the Bugbrook contract; the Kilsby tunnel would cost more than the revised estimate because of falls and flooding. The Blisworth contract was described as 'difficult'. Six months later the Directors noted that stations would cost some £630,000 more than their estimate. The increased cost of stations could not be blamed on any individual; ". . . they had no experience to guide them in forming a proper estimate. . . ."[6]

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[1] *Reports and Accounts*, dated 7th August, 1835.

[2] This latter figure is taken from the *Accounts* and may refer to payments for more than 1,293 acres.

[3] *Reports and Accounts*, dated 18th February, 1836.

[4] *Ibid.*, 3 February, 1837.

[5] Appendix to *Reports and Accounts*, dated 17th February, 1837.

[6] *Ibid.*, dated 21st August, 1838.

Thus despite the difficulties of comparing estimates with eventual expenditure it can be seen from these figures that while land cost more than was expected, part of the increase was due to the purchase of more than had been anticipated.[1] The greatest increase in expenditure, however, was due to the difficulties of construction. Whether the strictures of the *Edinburgh Review*[2] applied to this company is a matter of opinion, but certainly the experience of the London and Birmingham Railway was a prime example of the technical difficulties of construction in this early period of railway building.

V

The foregoing analysis allows the conclusion that while individual landowners may have done well out of the sale of land to railway companies—and may even have 'blackmailed' the companies on occasion, the latter nevertheless spent the bulk of their money on the more legitimate side of their business.[3] British railway companies would have gained if land had been cheaper; but this would not appreciably have reduced their difficulties.

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[1] The figure of £750,000 usually quoted as that expended on land (see Spencer, *op cit.*, p. 12; Smiles, *op. cit.*, p. 241) is presumably taken from a later *Account* by which time further purchases of land had been made. The original estimate of £250,000 is therefore not comparable to this figure. The story in Francis, *op. cit.*, I, p. 189, repeated in Sherrington, *op. cit.*, I, p. 21, and *A Hundred Years of Inland Transport*, 1934, p. 57, that the original estimate was changed to £750,000 in order to conciliate the landowners is probably apocryphal.

[2] October, 1846, p. 485. "The very limited number of engineers who, having already been employed in the coal districts of the northern counties were presumed to have had some experience in railway works, were soon engrossed to the full extent of their time and powers. Great enterprises, consequently, fell under the superintendence of persons having neither the peculiar knowledge nor experience which they required."

[3] This conclusion is strengthened when capital expenditure after this initial period is considered. While new lines were built (meaning therefore further land purchases) it is obvious that most expenditure would be on the carrying department and stations. So that the proportion of land to total costs would gradually fall through time.

RAILWAY CONSTRUCTION COSTS TABLE

Railway Company.	(1) *Total Expenditure*	(2) *Land*	(3) (2) as % of (1)	(4) *Cost of Engines and Stations*	(5) (1) *less* (4)	(6) (2) *as* % *of* (5)	(7a) *Date of Opening of Line*	(7b) *Date to which Expenditure refers*
	£	£		£				
Liverpool Manchester	739,165	95,305	12.9	52,689	676,476	14.1	15-9-30	31-5-30
Grand Junction	1,496,037	211,230	14.0	139,568	1,356,469	15.5	4-7-37	30-6-37
Newcastle Carlisle	1,031,827	126,201	12.2	66,722	965,105	13.0	18-6-38	30-6-41
London Birmingham	4,751,135	537,596	11.1	194,343	4,556,792	11.8	17-9-38	31-12-38
London Southampton ..	1,765,640	267,940	15.0	161,339	1,604,301	16.7	24-9-38	30-6-39
York and North Midland ..	547,136	65,784	12.0	40,550	506,586	13.0	29-5-39	30-6-41
North Midland	2,929,697	363,826	12.4	316,069	2,613,628	13.9	1-7-40	31-12-40
Birmingham and Gloucester ..	1,313,696	143,208	10.9	65,052	1,248,644	11.5	17-12-40	30-6-41
Great North of England ..	997,148	182,588	18.3	42,342	954,806	19.2	4-1-41	30-6-41
Manchester and Leeds	2,728,270	295,936	10.8	321,149	2,407,121	12.3	1-3-41	30-6-41
Glasgow, Paisley, Kilmarnock and Ayr	461,071	50,149	10.8	—	461,071	10.8	31-3-41	23-8-41
Cheltenham and G.W. Union..	416,569	58,815	14.1	—	416,569	14.1	31-5-41	24-6-41
Taff Vale	539,723	57,132	10.5	24,934	514,789	11.1	10-6-41	31-12-41
Great Western	5,877,120	750,524	12.7	386,900	5,490,220	13.6	30-6-41	30-6-41
Midland Counties	1,524,781	228,243	14.9	101,137	1,423,644	16.0	1-7-41	30-6-41
London and Brighton	1,951,907	386,725	19.8	66,005	1,885,902	20.5	21-9-41	30-6-41
Ulster	267,524	42,309	15.6	25,865	241,659	17.3	8-11-41	30-6-41
Eastern Counties	2,699,266	748,271	27.7	89,338	2,609,928	28.6	29-3-43	4-1-41
Bristol and Exeter	2,054,873	279,967	13.6	65,796	1,999,077	14.0	1-5-44	31-12-45
Lancaster Carlisle	1,291,913	112,822	8.6	166,008	1,125,905	10.0	17-12-46	30-6-47
South Staffs.	779,107	164,267	21.0	57,062	722,045	22.7	9-4-49	14-9-50
Manchester, Buxton, Matlock and Midlands Junction ..	377,190	27,667	7.3	—	377,190	7.3	4-6-49	31-12-49
Leeds and Thirsk	1,766,320	159,188	9.0	153,986	1,612,334	9.8	10-7-49	30-6-49
Manchester, Sheffield and Lincs.	6,760,704	598,289	8.8	—	6,760,704	8.8	17-7-50	30-6-50
Oxford and Rugby	1,145,086	165,306	14.3	11,516	1,133,570	14.5	2-9-50	31-12-52
Chester and Holyhead	3,223,062	292,413	9.0	138,233	3,084,829	9.4	21-10-50	31-12-50
South Wales	3,546,143	462,311	13.0	121,560	3,424,583	13.5	28-12-53	30-6-54

NOTE.—The figures in Column (1) have been adjusted where necessary to allow for Revenue Account statistics. Where the figure for the purchase of a canal or other railway is mentioned, it has been subtracted in Column (4).

SOURCES.—Newcastle Carlisle, Great North of England and York and North Midland from Tomlinson, *op. cit.*, p. 355. Eastern Counties from MSS. Minute Books. London and Birmingham from B.P.P., 1839, X, p. 381. Liverpool Manchester from Booth, *op. cit.*, p. 97. London and Southampton from *Railway Times*, 1839, p. 598. The following from *Herapath's Railway Magazine*, 1841: London and Brighton, p. 683, Birmingham and Gloucester, p. 728, Ulster, p. 803, Glasgow, Paisley, Kilmarnock and Ayr, p. 815, Manchester Leeds, p. 824, Cheltenham and Great Western Union, p. 942. *Herapath*, 1849, p. 929, Leeds and Thirsk. *Herapath*, 1850, p. 857, Manchester, Sheffield and Lincs. The remaining figures have been taken from the companies' printed *Reports and Accounts*. (The Oxford and Rugby

Price Changes and the Stability of the Balance of Trade[1]

By W. Beckerman

It has been a customary feature of balance of trade analysis for many years to regard the effects on income of a change in the balance of trade to be such that the final equilibrium level of the balance of trade will differ from the original level by less than the amount of the initial change. In this sense the multiplier effects of a change in the balance are " stabilising "; that is to say, the multiplier effects of the change in the balance tend to eliminate part of the initial change, rather than magnify it (though it is possible for investment to be related to income in such a way that the situation is " unstable "). The object of this note is to show how the relaxation of the customary " rigid ' multiplier ' assumption that all prices remain unchanged "[2] involves fundamental modifications and additions to the stability conditions which are normally found in the multiplier approach to balance of trade analysis. The introduction of price changes into the determination of the foreign trade multiplier may, in some cases, introduce stability or instability in what would otherwise be unstable or stable situations respectively.[3]

If it is assumed that prices change as income changes, then the effect of a rise in export prices on the value of exports depends on the elasticity of demand for exports. If the demand is inelastic the value of exports will increase if a rise in income causes a rise in export prices.

On the side of imports, there will be, in addition to the change in imports due solely to the change in income, a substitution effect as home prices change relatively to import prices.

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[1] I am very much indebted to Professor Brian Tew and Mr. Ivor Pearce for various criticisms and suggestions, and to Mr. S. A. James for valuable assistance with the mathematics. Needless to say, I am fully responsible for any defects that this paper may contain.

[2] J. E. Meade: " National Income, National Expenditure and the Balance of Payments, Part I ", *Economic Journal*, December 1948, p. 494.

[3] A similar possibility is noted by O. Lange: *Price Flexibility and Employment*, p. 50. While in Lange the basic stability discussed is that concerned with his general thesis of price expectation, his recognition of the equivocal role of foreign trade involves possible combinations of elasticities similar to those suggested in the present article.

There will thus be a price-induced effect on the balance of trade of a change in income in addition to the normal marginal propensity to import. One can conceive then of a " marginal propensity of the balance of trade to change " due solely to price changes when there are changes in income (in addition to the change in the balance arising from the marginal propensity to import). This propensity may be positive if foreign demand for exports is very inelastic and the substitution effect is not very strong. If the foreign demand for exports is very elastic, this balance of trade propensity may be very large and negative—a rise in export prices causing a severe fall in the value of exports.[1]

As one is usually interested in the money value of the balance of trade and as home prices are to be allowed to change it is appropriate to investigate the relation between the money balance of any country and its money income (i.e., the resultant of real output and the price level). Thus there is no attempt here to compare a real-income multiplier when prices are changing with the usual real-income multiplier in which prices are assumed constant. The end product in which we are interested here is the behaviour of the money balance of trade, and it is partly for simplicity that this is approached through money income rather than any other concept of income. Throughout this paper all items such as income, exports and imports, etc., refer to the money values of these items unless otherwise stated, and the multiplier concerned will be a money income multiplier.

The following symbols will be used :—

Y = Income.
P = Price level (both domestic and export prices).
H = Consumption of home products (quantity).
F = Consumption of foreign products (quantity).
I = Real Investment.

Single primes denote symbols relating to country 1, and double primes denote symbols relating to country 2. It is assumed for simplicity of exposition that these two countries exhaust the whole world, that the coefficients used and also exchange rates are constant for all levels of income.

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[1] For full diagrammatic treatment see K. Savosnik : " National Income, Exchange Rates and The Balance of Trade ", *Economica*, May 1950, and my note of the same title, *Economica*, August 1951.

Thus, for example, $P'F''$ represents the value of country 2's imports from country 1.

Suffixes refer to time periods.

We can now write the following equations :—

$$P'_t = \epsilon' + \lambda' Y'_t \quad \dots\dots\dots\dots (1')$$

{i.e., if Y'_r is real output, $Y'_r = \frac{Y'}{P'}$ and thus P' increases as Y'_r increases, whilst at the same time Y'_r approaches assymptotically the limit $\frac{1}{\lambda'}$},

similarly $$P''_t = \epsilon'' + \lambda'' Y''_t \quad \dots\dots\dots\dots (1'')$$

The consumption function of country 1 for its home products may be written as :—

$$P'_t H'_t = k' Y'_{t-1} - \alpha' P'_{t-1} + \beta' P''_{t-1} + H' \quad \dots\dots (2')$$

and for country 2,

as $$P''_t H''_t = k'' Y''_{t-1} - \alpha'' P''_{t-1} + \beta'' P'_{t-1} + H'' \quad \dots (2'')$$

{Thus k is the money propensity to consume home products, α and β are substitution effects—i.e., α is the substitution of imported goods for home as home prices rise, and β is the substitution of home goods for imported goods as import prices rise.}

The total income of country 1 will be composed as follows :

$$Y'_t = P'_t H'_t + P'_t F''_t + P'_t I'_t \quad \dots\dots\dots\dots (3')$$

and of country 2,

$$Y''_t = P''_t H''_t + P''_t F'_t + P''_t I''_t \quad \dots\dots\dots\dots (3'')$$

Total money expenditure on consumption goods in period t by either country depends on its income of the previous period :—

$$P'_t H'_t + P''_t F'_t = c' Y'_{t-1} \quad \dots\dots\dots\dots (4')$$

and $$P''_t H''_t + P'_t F''_t = c'' Y''_{t-1} \quad \dots\dots\dots\dots (4'')$$

∴ From 2′

$$P''_t F'_t = (c' - k') Y'_{t-1} + \alpha' P'_{t-1} - \beta' P''_{t-1} + F' \quad \dots (5')$$

and from 2″

$$P'_t F''_t = (c'' - k'') Y''_{t-1} + \alpha'' P''_{t-1} - \beta'' P'_{t-1} + F'' \quad .. (5'')$$

We begin by examining the foreign trade multiplier for country 1 under the assumption that there are no foreign repercussions. It is also assumed throughout the analysis that 'real' investment is constant (i.e., $I'_t = I'$ for all t). From 3 we have that

$$\begin{aligned} \triangle Y'_t &= \triangle(P'_t H'_t) + \triangle(P'_t F''_t) + \triangle(P'_t I'). \\ &= k' \triangle Y'_{t-1} - \alpha' \lambda' \triangle Y'_{t-1} - \beta'' \lambda' \triangle Y'_{t-1} + \\ &\qquad \lambda' I' \triangle Y'_t \dots\dots\dots (6') \end{aligned}$$

The sum of the 2nd and 3rd terms on the right-hand side of this equation thus equals the price-induced change in the balance of trade $= \triangle B'_t$.

$$\therefore \triangle B'_t = -\lambda'(\alpha' + \beta'')\triangle Y'_{t-1}$$

$$\therefore \text{ if } \frac{\triangle B'_t}{\triangle Y'_{t-1}} = g', \text{ then } g' = -\lambda'(\alpha' + \beta'') \quad \ldots\ldots(7')$$

Thus if $(\alpha' + \beta'') < 0$ (i.e., value of exports increases more than price-induced increase in value of imports), $g' > 0$. The total change in the balance is, of course, equal to $g'\triangle Y'_{t-1}$ minus the propensity to import, and is thus equal to

$$g'\triangle Y'_{t-1} - (c' - k')\triangle Y'_{t-1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(8')$$

Let the total propensity for the balance to change in period t due to a change in income in period $t - 1$ equal μ'.

$$\text{Then } \mu' = g' - (c' - k') \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(9')$$

The behaviour of the balance (i.e., whether it is oscillating, converging, etc.) depends then on the behaviour of income, being related to income by μ'. Thus we must now investigate the stability conditions relating to income.

From (6′) and (7′) we obtain

$$\triangle Y'_t = \frac{(k' + g')}{(1 - \lambda' I')}\triangle Y'_{t-1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(10')$$

Thus $\frac{(k' + g')}{(1 - \lambda' I')}$ is the common ratio of the series of income increments. Let this common ratio equal r'. It should be observed that investment appears in the common ratio, for the following reason. Whilst it has been assumed that real investment is constant it is also assumed that all home prices are changing to the same extent (λ). Thus money investment in period t changes by $I'\lambda'\triangle Y'_t$. In short, there is in every period a fresh injection of an investment multiplier. It can be seen in equation (10′) above that as I' increases the common ratio increases.

In normal multiplier analysis, the simplest case is where the common ratio equals the propensity to consume home products, corresponding to k' above. As this is always positive and less than unity, this means that the series always converges and also cannot oscillate. With less simple multipliers in which investment is allowed to change it is generally recognised (e.g., Metzler,[1] and Meade[2]) that the situation may be no longer stable. If v' is the marginal propensity to invest then the situation is stable or unstable according to whether $(k' + v') \lesseqgtr 1$. With the common ratio r' above, however, the component g' can be of either sign, and if negative can theoretically be very much greater than unity (i.e., a very large fall in exports as export prices rise). Thus r' can be positive or negative and numerically greater than or less than unity. So that as well as the possibility of instability[1] in the sense of divergence if $r' > 1$, there will also be oscillation if $r' < 0$, and explosive oscillation if $r' < -1$. Furthermore the restriction on divergence usually imposed by the limit on productive capacity[2] when prices are assumed constant will not apply in the present case.

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[1] L. A. Metzler: "Underemployment Equilibrium in International Trade", *Econometrica*, 1942, p. 101.

[2] J. E. Meade: *op. cit.*, p. 495.

We must now consider the effect of foreign repercussions on the stability conditions.

It has already been stated that real investment is assumed to be constant. As in any period, total money income equals money consumption of home goods plus money investment, we have

$$P'_tH'_t + P'_tF''_t = Y'_t - P'_tI' \quad \ldots\ldots\ldots\ldots\ldots\ldots(11')$$

$$\text{and } P''_tH''_t + P''_tF'_t = Y''_t - P''_tI'' \quad \ldots\ldots\ldots\ldots(11'')$$

Then from (1′), (1″), (2′), (2″), (5′), (5″), (11′) and (11″), we obtain

$$\begin{aligned} Y'_t(1 - \lambda'I') = {} & Y'_{t-1}(k' - \alpha'\lambda' - \beta''\lambda') + \\ & Y''_{t-1}(c'' - k'' + \alpha''\lambda'' + \beta'\lambda'') + \epsilon'(I' - \alpha' - \beta'') \\ & + \epsilon''(\alpha'' + \beta') + H' + F'' \ldots\ldots\ldots\ldots\ldots(12') \end{aligned}$$

$$\begin{aligned} \text{and } Y''_t(1 - \lambda''I'') = {} & Y''_{t-1}(k'' - \alpha''\lambda'' - \beta'\lambda'') + \\ & Y'_{t-1}(c' - k' + \alpha'\lambda' + \beta''\lambda') + \\ & \epsilon''(I'' - \alpha'' - \beta') + \epsilon'(\alpha' + \beta'') + H'' + F' \ldots(12'') \end{aligned}$$

From these two equations we derive the incremental equations :—

$$\begin{aligned} \triangle Y'_t = {} & \frac{k' - \lambda'(\alpha' + \beta'')}{1 - \lambda'I'} \triangle Y'_{t-1} + \\ & \frac{c'' - k'' + \lambda''(\alpha'' + \beta')}{1 - \lambda'I'} \triangle Y''_{t-1} \quad \ldots\ldots\ldots\ldots(13') \end{aligned}$$

$$\begin{aligned} \text{and } \triangle Y''_t = {} & \frac{k'' - \lambda''(\alpha'' + \beta')}{1 - \lambda''I''} \triangle Y''_{t-1} + \\ & \frac{c' - k' + \lambda'(\alpha' + \beta'')}{1 - \lambda''I''} \triangle Y'_{t-1} \quad \ldots\ldots\ldots\ldots\ldots(13'') \end{aligned}$$

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[1] For diagrammatic representation of stability and instability conditions, *inter alia*, see H. G. Johnson: "Diagrammatic Analysis of Income Variations and the Balance of Payments", *Quarterly Journal of Economics*, November 1950.

[2] Cf. R. G. Hawtrey: "Multiplier Analysis and the Balance of Payments", *Economic Journal*, March 1950, p. 4. The same limit plays a much greater role, of course, in J. R. Hicks: *A Contribution to the Theory of the Trade Cycle.*

Simplifying as in equations (7′), (8′) and (9′) above, we can re-write equations (13′) and (13″) as

$$\triangle Y'_t = \frac{k'+g'}{(1-\lambda' I')}\triangle Y'_{t-1} - \frac{\mu''}{(1-\lambda' I')}\triangle Y''_{t-1}\ldots\ldots(14')$$

and $$\triangle Y''_t = \frac{k''+g''}{(1-\lambda'' I'')}\triangle Y''_{t-1} - \frac{\mu'}{(1-\lambda'' I'')}\triangle Y'_{t-1}\quad ..(14'')$$

{The effect of investment may be removed for purposes of exposition in the following manner. If both sides of the above equations are multiplied by the respective denominators of the right hand sides, then taking, say, (14′) we have

$$\triangle Y'_t - \lambda' I \triangle Y'_t = (k'+g')\triangle Y'_{t-1} - \mu''\triangle Y''_{t-1}$$

That is to say the increase in income minus the effect of the rise in prices in the investment sector depends on the propensity to consume home products (k'), the price-induced propensity for the balance to change (g') and the propensity for the foreign balance to change as foreign income changes (μ'').}

Let $\frac{k'+g'}{1-\lambda' I'} = r'$, and $\frac{k''+g''}{1-\lambda'' I''} = r''$,

$\frac{\mu'}{1-\lambda'' I''} = \eta'$, and $\frac{\mu''}{1-\lambda' I'} = \eta''$.

Then the stability of the system depends on the roots of the quadratic equation

$$x^2 - (r'+r'')x + (r'r'' - \eta'\eta'') = 0.$$

{It is assumed that it is not necessary to repeat in detail the problem of solving second-order difference equations as this has already become quite a standard technique in economics, e.g., Metzler,[1] Samuelson,[2] Hicks,[3] Stone[4] and A. Smithies,[5] and others.}

Thus a necessary condition for stability is that $|(r'+r'')| < 2$. This may be compared with the corresponding condition in Metzler,[6] where $r' = (k'+v')$ and $r'' = (k''+v'')$; (v being the marginal propensity to invest). This is that $(r'+r'') < 2$.

The Metzler condition requires, of course, that if one country is unstable (say $r' > 1$) then the other country must be stable (i.e., $r'' < 1$).[7]

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[1] L. A. Metzler: *op. cit.*

[2] P. A. Samuelson: *Foundations of Economic Analysis*, Mathematical Appendix B, and chapter on "Dynamic Process Analysis" in *Survey of Contemporary Economics* for a chatty exposition.

[3] J. R. Hicks: *op. cit.*, Mathematical Appendix.

[4] J. R. N. Stone: *Role of Measurement in Economics*, ch. 10.

[5] A. Smithies: "Process Analysis and Equilibrium Analysis", *Econometrica*, 1942.

[6] Metzler: *op. cit.*, p. 102.

[7] Metzler: *loc. cit.*

But with the condition $|(r' + r'')| < 2$, the situation is only analogous to the Metzler condition if r' and r'' are of the same sign. For while $|(r' + r'')| = |r'| + |r''|$ if both these elements are of the same sign, $|(r' + r'')| = |r'| - |r''|$ if they are of opposite signs. Thus we can have $|(r' + r'')| < 2$ even with both countries unstable if they are unstable in opposite directions, i.e., if both r' and r'' are numerically greater than unity but of opposite signs (and the sufficient condition which also involves η' and η'' can still be satisfied). For example, if $r' = +2$ and $r'' = -1{\cdot}5$, then $(r' + r'') = +{\cdot}5$. Thus the combination of the two countries can be stable, with the instability of each country offsetting that of the other, whereas in the Metzler case instability must always be in the same direction and so the offsetting situation cannot arise.

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Some Questions About Ricardo[1]

By T. W. Hutchison

I

Last year, during the Festival Summer, the Royal Economic Society issued the opening volumes of its edition of the Works of David Ricardo, a project first agreed upon in principle by the Council of the Society in 1925, and, on Keynes' suggestion, actually commenced in 1930 by Mr. Sraffa. The first reaction, which will be permanently sustained on handling and studying these volumes, is bound to be one of gratitude and delight for such paragons of editorial scholarship and of the publisher's art. There can be no edition in English of the complete works of any economist which remotely begins to compare with this edition of Ricardo (except, possibly, in the case of one or two of the great philosophers who also wrote on political economy). However, as the successive apartments of this palace are one by one opened up to the public, certain questions—irrelevant perhaps, but almost automatic in these invidious days of 'fair shares', begin to occur. One begins to compare this new and sumptuous accommodation of Ricardo's with the ancient and inaccessible abodes with which so many distinguished economists, and those who wish to make their acquaintance, still have to make do.

Perhaps it is naive to try to weigh up the importance of an economist's contribution by the extent to which his ideas correspond with what have since become widely accepted approaches and conclusions on the subject. But if the modern subjective value theory and the Keynesian analysis of effective demand mean anything, the approach of Steuart and Lauderdale on these central subjects was, very broadly speaking, 'right', and Ricardo's, broadly speaking, was not 'right'. But while the latter's *Principles* have gone through numerous editions, popular and otherwise, culminating in Mr. Sraffa's Vol. I, Lauderdale and Steuart have not been republished in English for well over a century. Then again, in the English-speaking world, both Thünen and Walras are still completely out in the cold, hardly one word of their works being available in English. But—for better or for worse—there is far more of Thünen and Walras alive in, and relevant to, modern analysis, as now studied, than there is of Ricardo. One could, of course, continue like this for several pages.

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[1] *The Works and Correspondence of David Ricardo.* Nine volumes. Edited by Piero Sraffa. Cambridge University Press. 1951-52. 24s. per volume. Only Vols. I—V (*Works*) were as yet available as a basis for this article.

These questions may be rather querulous and invidious, but they do, after all, lead round to the task, the rendering possible of which will be a main raison d'être of these volumes, when the set is complete: that is, the task of elucidating and establishing what Ricardo contributed to economic knowledge, or, in other words, the place and significance of his works in the history of the subject. This edition issued by the Royal Economic Society gives Ricardo's complete works a setting and position unrivalled by any other economist's writings in English. How far does the actual content and influence of these works measure up to this unique position? Those attached to classical economic liberalism, on the one hand, or Marxian economics, on the other, have no doubt about the answer. But what exactly is it in Ricardo's writings which has given rise to this rather odd alliance of opinion, and is it anything acceptable to those who are neither Marxists nor classical liberals? We do not try to answer these questions here, but simply to set out some material which ought to be considered when a full answer *is* attempted.

II

A very little probing suffices to reveal how many strangely contrasting, if not contradictory, judgments about the contribution and significance of Ricardo's works have been in circulation. Let us start, for example, from one or two indications of Keynes' views on the subject—(or perhaps we should say indications of one or two of Keynes' views on the subject). For Keynes was one of the main inspirers of this edition. On the one hand he is reported as holding that

"Ricardo's was the greatest mind that found economics worthy of its powers."[1] Elsewhere, Keynes argues: "The complete domination of Ricardo's approach for a period of 100 years has been a disaster to the progress of economics . . . If only Malthus, instead of Ricardo, had been the parent stem from which 19th-century economics proceeded, what a much wiser and richer place the world would be to-day! We have laboriously to rediscover and force through the obscuring envelopes of our misguided education what should never have ceased to be obvious."[2]

In the idea of a great mind leaving the world a poorer and more foolish place than it otherwise would have been there is, of course, nothing incongruous. That is the sort of thing that great minds and great men frequently do. But at least it seems to be clear that, from a Keynesian point of view at any rate, a particularly close scrutiny is called for of the nature and effects of Ricardo's intellectual greatness. Then, again, what truth, *if any*—(as examination questions put it)—is there in Keynes' description of Ricardo as 'the parent stem from which 19th-century economics proceeded'? According to Schumpeter, Ricardian economics was dead by 1830—(except for its socialist and Marxist progeny).[3] Of course, Keynes may simply have wanted to imply that the classical Law of Markets dominated 19th-century economics and that its domination was assisted by Ricardo's great authority. But Ricardo was certainly not the originator of the law, which pervaded neo-classical economics almost as much as it had the classical system, and which, therefore, it is hardly appropriate to describe as 'Ricardian'. In this case we simply have one of many examples of the way in which the magic name of Ricardo has been conjured with in generalisations about the history of economic thought.

In fact, one of the first steps in a programme of clarification and re-assessment might be to make a certain deflationary correction of that cumulative process by which so many of the achievements of the classical opening decades of the 19th century—certainly through no aggrandising efforts of Ricardo himself—nevertheless got labelled with his name.

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[1] See R. F. Harrod, *Life of J. M. Keynes*, p. 467.

[2] J. M. Keynes, *Essay in Biography*, 1933, p. 141 and 144. Some, of course, would agree with Schumpeter in finding this quotation from Keynes "an astounding statement". See *Economic Journal*, 1933, p. 653.

[3] See *Quarterly Journal of Economics*, May 1951, p. 166.

This applies to theories of rent, comparative costs, and also perhaps even of money and interest, in which Ricardo had a leading and subjectively original, but nevertheless by no means an exclusive, share—(not to mention subsequent Ricardian " effects " with which his exact relationship is even more uncertain). Then, when it is clearer what may reasonably be described as " Ricardian " contributions, and what not, the much larger question of their significance and the extent of their potency will have to be re-examined.

Here we are only concerned with the central doctrines of Ricardo's *Principles* which we shall examine from the points of view of his contributions to (*a*) " Mercantilist "-Keynesian, (*b*) Marxian, and (*c*) Neo-Classical economics.

Under heading (*a*) the answer seems to be fairly clear-cut. Ricardo's more abstract reasonings in the " Notes on Malthus " are already well known. But in Vol. V of this new edition we have Ricardo giving us the Classical Law of Markets in action. It is quite impossible that he is *simply* concerned with an abstract ' model ' or ' first approximation ' in which he is excusably omitting to state explicitly all his simplifying assumptions. He is discussing economic policy with practical men in the depressed times of 1819. In his Answers to Questions 63–76 in his Evidence to the Lords' Committee on the Resumption of Cash Payments Ricardo argues, for example, as follows :

> " 63. Supposing we were to adopt a Plan which should annihilate that Demand for 15 Millions of our Manufactures, do you suppose that that Portion of Wealth would at all exist, in so far as it is composed of Manufacturing Labour ?
>
> I think it would ; because the Quantity of Labour employed and Commodities produced must be in proportion to the Capital we have ; and there can be no Production without occasioning an equal Consumption ; In this Case, I think we should consume the Commodities ourselves ; in the other Case, they would be consumed by others.
>
> 64. Do you mean to say, that an extra Demand for the Commodities of the Country would not produce any Increase of its Manufactures ?
>
> I should very much doubt whether it would ; the sole Difference would be, with respect to what Commodities would

be produced, and to the more advantageous Exchange we should make, by having a more extended Market . . ."[1]

Their Lordships' questions and Ricardo's answers continue in exactly this strain and on exactly these assumptions, for several pages.

Here again is Ricardo urging upon the House of Commons the obvious practical conclusion to be drawn from the Law of Markets, that public works could not possibly help to remedy depression. In the course of "offering a few observations on what he considered the cause of the distresses of the country" Ricardo remarked: "When he heard Hon. Members talk of employing capital in the formation of roads and canals, they appeared to overlook the fact that capital thus employed must be withdrawn from some other quarter".[2] This doctrine of the (then) "New Political Economy", as it was called, would, of course, have made nonsense to Petty, Mandeville, Boisguillebert, Berkeley, Quesnay, or Steuart. But with all that rather hubristic contempt for their predecessors which one is apt to come across in some of the leading exponents of classical economic liberalism, James Mill and Say had, with their Copernican discovery, "exploded" (as J. S. Mill put it) the crude fallacies of the eighteenth century. And now proclaimed by Ricardo's authority, the doctrine against public works was, of course, eventually to become by 1929 "the orthodox Treasury dogma steadfastly held" (as Mr. Winston Churchill described it in a famous restatement). So much for Ricardo's main "Mercantilist"–Keynesian (or pre- or post-classical) point of view.

(*b*) Ricardo's contribution to (or from the point of view and criteria of) Socialist and Marxist economics seems as clearly positive as it is negative in the case of Keynesian economics. It is true that many of the raw materials of the Ricardian-Marxian system are to be found in *The Wealth of Nations*. But it was Ricardo who set up "class" distribution, dominated by the direct clash of interest between wages and profits, as "the principal problem in Political Economy", and it was Ricardo who contracted Adam Smith's ambiguous labour theory of value into a more rigid labour-embodied doctrine. Of course, there are several important points on which Ricardo deviates from the orthodox Marxist position to a " hyena "-like or even " cannibalistic " extent. For example, his denial of any essential connection between the problem of value and his analysis of distribution is completely un-Marxian,[1] (and also, in a different way, in complete contrast with the unified neo-classical marginal theories). But with his labour-embodied standard of value, and with his macro-dynamic class-distribution analysis, with the clash of interests and his—to put it mildly—somewhat bleak view of the actual prospects and probabilities for wages (pious hopes are another matter),[2] and finally with his analysis of the falling rate of profit, Ricardo provided the foundations for the greater part of Marxian economics. Perhaps this is more completely so on the side of his historical-dynamic distribution analysis than it is with his analysis of value, a subject which in the Marxian theory is essentially connected with the distribution doctrine in a way in which it is not essentially so for Ricardo—at any rate in his " moments of discouragement ".

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[1] Evidence of March 24th, 1819: See Vol. V, pp. 434-438. See also Ricardo's notes on and draft review of Blake's *Observations on the Effects Produced by the Expenditure of Government . . .*, published for the first time in Vol. IV, pp. 324ff, especially p. 356.

[2] Vol. V, p. 32. (Dec. 16th, 1819.)

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[1] " After all, the great questions of Rent, Wages and Profits must be explained by the proportions in which the whole produce is divided between landlords, capitalists, and labourers, and which are not essentially connected with the doctrine of value." (From a letter to McCulloch of June 13th, 1820, quoted by Sraffa, Vol. I, p. xxxiii.) According to Mr. Sraffa, supported by references to other correspondence not yet published, this sentence was written " in a moment of discouragement ". However, Mr. Sraffa elsewhere points out that not only in " moments of discouragement ", but in his whole original approach, his problem of value was, for Ricardo, quite separate from his problem of distribution. For some time after he began working on the *Principles* " there is no reference to value " in his correspondence. It is only after he had proceeded some way that " this is mentioned for the first time as a separate subject with which it occurred to Ricardo that he would have to deal ". (Sraffa, Vol. I, p. xiv.) No one formulating the problems of value and distribution either in the Marxian or in the neo-classical way would have developed and held to their ideas in the order in which Ricardo did.

[2] The following passage exemplifies the rather baffling amalgam of ambiguity, pessimism, and pious hopes to be found in Ricardo's remarks on the prospects for wages. The first edition of the *Principles* reads : " The amended condition of the labourer, in consequence of the increased value which is paid him, does not necessarily oblige him to marry and take upon himself the charge of a family—he may, if it please him, exchange his increased wages for any commodities that may contribute to his enjoyments—for chairs, tables and hardware ; or for better clothes, sugar, and tobacco. His increased wages then will be attended with no other effect than an increased demand for some of those commodities ; and as the race of labourers will not be materially increased, his wages will continue permanently high. But although this might be the consequence of high wages, yet so great are the delights of domestic society, that *in practice it is invariably found that an increase of population follows the amended condition* of the labourer." This seems clearly to imply that 'in practice' and 'invariably', even though they may be temporarily raised, the long-run prospects for wages are rather bleak. But in the third edition " he may if it please him " (spend more on his own food and enjoyments) becomes " he will, in all probability " so do, without any change in the subsequent statement of what, on the contrary, 'invariably' happens 'in practice'. It is anybody's guess as to what exactly this passage now implies, but considerable justification remains in the words we have italicised for ascribing to Ricardo pessimistic views as to the long-run possibilities of raising the standard of living by redistribution or in any other way. See Vol. I, *Principles*, pp. 406-7.

However, it was the Councillors of the Royal Economic Society in 1925, and not the Moscow State Publishing House, who sponsored this edition, and perhaps a majority of the members of the Society would, rightly or wrongly, then not have quarrelled much with Keynes' verdict, pronounced in that year on *Das Kapital*, as being " an obsolete economic textbook which I know to be not only scientifically erroneous but without interest for the modern world."[1] It can hardly have been for the sake of Ricardo's contribution to Marxian economics that the then Secretary and other officers of the R.E.S. sponsored this edition.[2]

(*c*) This brings us to Ricardo's contribution to neo-classical economics ; that is, to the dominant academic orthodoxies of 1925 when this edition was first resolved upon, when Stanley Baldwin was in the prime of his statesmanship, when on the basis of a restored Gold Standard the £ was once again " looking the dollar in the face ", when unemployment was running at a steady 10 to 12 per cent, and when

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[1] *Essays in Persuasion*, p. 300.

[2] On the other hand, if not for the Secretary, at any rate for the then President of the Society, the Marxian legacy of Ricardo was something too important and obvious to be ignored. For Foxwell apparently excused himself from delivering his Presidential address to the Society on Ricardo, at about the time at which active work on this edition was beginning, " on the grounds that his onslaught on the man who had convinced the world of the dreadful heresy of a necessary conflict between the interests of capital and labour, would have been too provocative ". (See Keynes' obituary article, *Economic Journal*, 1936, p. 592.) Whatever may be thought of President Foxwell's political preconceptions, or of his Celtic " provocativeness ", there is from the point of view of a liberal neo-classical economist a certain forthright, straight-thinking logic in his point of view, with which it is difficult to feel sure that all neo-classical judgments of Ricardo's work were invariably imbued. Foxwell had given his views on Ricardian economics thirty years before in his remarkable introduction, on the Ricardian socialists, to the translation of Anton Menger's book *The Right to the Whole Produce of Labour* (1899):

" I am more and more impressed, as I study the literature of socialism, with the far-reaching, disastrous consequences of the unfortunate colour given to economic teaching by Ricardo, and the little band of able, but somewhat hard and narrow writers who called themselves by his name. As Dr. Menger clearly shows, it was Ricardo's crude generalisations which gave modern socialism its fancied scientific basis, and provoked, if they did not justify, its revolutionary form. There are times when we are disposed to underrate the value of that drill in method which is a principal part of academic training. At such times we should think of Ricardo. Ricardo, and still more those who popularised him, may stand as an example for all time of the extreme danger which may arise from the unscientific use of hypothesis in social speculations, from the failure to appreciate the limited application to actual affairs of a highly artificial and arbitrary analysis. His ingenious, though perhaps over-elaborated reasonings became positively mischievous and misleading when they were unhesitatingly applied to determine grave practical issues without the smallest sense of the thoroughly abstract and unreal character of the assumptions on which they were founded. . . . Meanwhile, by a singular irony of fate, it happened that Ricardo, by this imperfect presentation of economic doctrine, did more than any intentionally socialist writer to sap the foundations of that form of society which he was trying to explain, and which he believed to be the typical and natural, if not, indeed, the ideal social state." (pp. xl-xli.)

" it " being " all in " Marshall's *Principles*, this book constituted almost the exclusive alpha and omega of theoretical economics in Britain.

First it may be observed how unequally the neo-classical authorities were divided on this subject. The large majority regarded themselves as having turned their backs on what they understood to be Ricardo's central theories of value and distribution. It was not simply a case of a much quoted remark by Jevons about Ricardo having " shunted the car " along the wrong lines, or of the views of the, in some ways, unorthodox Foxwell. Wicksteed, Menger, Wieser, Böhm-Bawerk, J. B. Clark and Pareto all explicitly rejected the Ricardian theory of value and distribution in the bluntest terms.[1]

On the other side were the two Swedes, Wicksell and Cassel,[2] and, of course, Marshall. In fact, so dominating was Marshall's authority that in Britain at any rate he was able to establish his view as the orthodox one, as against the wide range of authorities who saw Ricardo's work very differently. Marshall's interpretation is given in his " Note on Ricardo's Theory of Value ".[3] A main purpose of this

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[1] On Ricardian economics Wicksteed believed that " Jevons' indignation is likely to inspire a more fruitful treatment than Dr. Marshall's reverence ". Carl Menger attacked Ricardo's theory of rent, and all labour and cost of production theories of value, root and branch. Wieser said flatly : " Ricardo's theory of value is wrong because the economic theory it presupposed is wrong " . . . " It offers no explanation of exchange " . . . The Marxian socialists simply carried to their logical conclusion the ideas " which the classics themselves had not the courage to think through to the end." Böhm-Bawerk was just as emphatic : " It was the development and popularising of the Ricardian theory of value which supplied the scientific soil out of which the exploitation theory could naturally spring and grow." . . . Ricardo's theory of value " is notoriously false ". Pareto, discussing the " iron " law of wages, says that " it was the consequence of the erroneous principle of value set up by Ricardo and adopted by other economists ". For J. B. Clark, too, in his essays in his *Philosophy of Wealth*, " Ricardianism " represented everything he sought to turn away from as an economist. It was Ricardianism which " prepares the soil for revolutionary seed ". (See Wicksteed, *Economic Works*, Vol. II, p. 819 ; Menger, *Principles*, translated by Dingwall and Hoselitz, p. 167-174 ; Wieser, *Gesammelte Abhandlungen*, pp. 64, 76 and 116 ; Böhm-Bawerk, *Capital and Interest*, translated by Smart, p. 317 ; and *Gesammelte Schriften*, p. 145 ; Pareto, *Les Systèmes Socialistes*, Vol. II, pp. 185, 241 and 340.

[2] For Wicksell's views see the opening sections of *Über Wert, Kapital und Rente.* Cassel gives a very sympathetic and lucid interpretation of Ricardo's remarks on value in his *Theory of Social Economy*, Vol. I, pp. 298-310.

[3] *Principles*, 8th Edition, p. 813, or 2nd Edition, p. 538. The Note originally began with a challenging paragraph omitted in later editions :—" Ricardo's theory of cost of production in relation to value occupies so important a place in the history of economics that any misunderstanding as to its real character must necessarily be very mischievous ; and unfortunately it is so expressed as almost to invite misunderstanding. In consequence there is a widely spread belief that it has needed to be reconstructed by the present generation of economists. The purpose of the present Note is to show cause for not accepting this opinion ; and for holding on the contrary that the foundations of the theory as they were left by Ricardo remain intact, that much has been added to them, and that very much has been built upon them, but that little has been taken from them ". It might be pointed out here that Marshall stresses that Ricardo's " exposition is as confused as his thought is profound ; he uses words in artificial

Note is, of course, to attack Jevons' famous historical generalisation about Ricardo. Marshall's method is to show that not merely is Ricardo's theory of value not open to Jevons' attacks, but that it is in essentials so uncriticisable as to be almost Marshallian: "The foundations . . . left by Ricardo remain intact" (in Marshall), and do not need to be reconstructed.

Certainly, there are considerable bits and pieces of the Marshallian structure which can be extracted and fitted together from Ricardo's chapter on Value and from elsewhere.[1] But perhaps it is significant that Marshall never quotes more than a couple of lines of Ricardo's words consecutively. In any case, what calls for examination is the relevance of such incidental passages to the main scheme of Ricardo's *Principles*, and whether they have any major purpose in Ricardo's system similar to the analysis of demand, supply, and value in Marshall's Book V. There is, perhaps, something rather questionable in the sort of intellectual generosity which assumes that Ricardo's interests and purposes, rightly understood, must certainly have been the same as one's own, when, after all, Ricardo was as explicit as he could have been that they were distinctly different: "The principal problem in Political Economy", and that problem around which Ricardo started to build up his *Principles*, is how "the produce of the earth . . . is divided among three classes of the community". This problem is not touched on in Marshall's Book V. It is also not touched on by the marginal productivity analysis, precisely interpreted, which answers very different questions about production and distribution, and it only comes in for some rather

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senses which he does not explain, and to which he does not adhere; and he changes from one hypothesis to another without giving notice"—(rather serious disadvantages in the composition of a book of Principles).

[1] E.g., the following paragraph from a Parliamentary Speech of June 12th, 1822 (Vol. V, p. 212):

"He fully agreed with the hon. member for Essex that there were various causes operating, also, on the value of gold, some of which were of a permanent, and others of a temporary, nature. The more or less productiveness of the mines were among the permanent causes; The demands for currency, or for plate, in consequence of increased wealth and population, were temporary causes, though probably of some considerable duration. A demand for hats or for cloth would elevate the value of those commodities, but as soon as the requisite quantity of capital was employed in producing the increased quantity required, their value would fall to the former level. The same was true of gold: an increased demand would raise its value, and would ultimately lead to an increased supply, when it would fall to its original level, if the cost of production had not also been increased. No principle was more true than that the cost of production was the regulator of value, and that demand only produced temporary effects". Such a passage only requires a little elaboration and expansion on the demand side to become a recognisable outline of the pattern of Marshall's Book V.

brief and intermittent remarks, mainly on *historical* lines, in Marshall's Book VI,[1] with nothing in the nature of a systematic analytical treatment. In fact, Ricardo's "principal problem" only received very occasional attention in neo-classical economics. Most of the more forthright exponents of marginal productivity disregarded it. The Ricardian problem was discussed fairly briefly by Wicksell and Böhm-Bawerk, and has been the subject, now and then, of ingenious, if inconclusive, abstract formulations, to the effect, largely, that anything may happen. This is not due to any conspiracy of silence or deliberate neglect. It has simply not been found to be a tractable analytical problem—a negative but perfectly sound conclusion. In the Marxist system, the macro-economic class distribution analysis is supported by a body of sociological and historical generalisations and classifications which probably a large majority of economists are unable to accept. Ricardo himself being quite innocent of history and sociology, though alive to topical clashes of interest, introduces his (or Adam Smith's) threefold class structure as something to be taken permanently for granted. In the neo-classical system, this Ricardian-Marxian starting-point of the three (or two) classes is entirely superfluous. It is as otiose for marginal productivity analysis to make a threefold classification of production goods as it would be to draw some threefold arbitrary classification of consumers' goods in the marginal utility theory of the consumer. Whatever the importance or interest of the Ricardian subject of class distribution there has here hardly emerged a problem to which analytical economics has been able to give an important answer. If any such answer could be found it would surely have to be by historical, sociological, or statistical studies, a treatment which Ricardian methods omitted. Pareto attempted one such study of distribution but in this has had very few successors.

What, unfortunately, Ricardo's problems and categories of value and distribution did all too readily lend themselves to, with their over-simplifications, and their highly charged political significance, were ideologies, slogans, and panaceas. In addition to the Marxian slogans there was that other body of 19th century doctrine, now defunct, but which had much genuine Ricardian blood in its veins, that of which the Henry George " Single Tax " doctrine was the best-known expression.

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[1] See *Principles*, 8th Edition, Book VI, Chapters XII and XIII, especially Chapter XII, Paras. 9 and 10.

Anyhow, Ricardo, in his opening chapter on Value, did not need, or use, except incidentally, a theory of value in anything like the same sense, or for anything like the same purpose, as Marshall, the Austrians, or any other neo-classical economist. However far the problem of value subsequently became the absorbing theoretical problem for Ricardo, the function of his opening chapter on Value in the *Principles* remained, as the book was planned, essentially preliminary and instrumental to his class distribution problem. As Mr. Sraffa puts it : " The problem of value which interested Ricardo was how to find a measure of value which would be invariant to changes in the division of the product. . . . Ricardo was not interested for its own sake in the problem of why two commodities produced by the same quantities of labour are not of the same exchangeable value." . . . The function of Ricardo's theory of value is that " of making it possible, in the face of changes in distribution, to measure changes in the magnitude of aggregates of commodities of different kinds or, what is even more important, to ascertain its constancy."[1]

On the other hand, the main function of neo-classical theories of value and distribution was primarily to elucidate formulæ for the optimum allocation of goods and resources by individual consumers and firms (and, in its welfare economics, by society). Ricardo's works have almost nothing about individual consumers and only very intermittent and abstract references to firms—mainly agricultural firms. He seems to have been very little in touch with manufacturing industry. Certainly, in his rent doctrine there is a hint of the marginal productivity analysis, but this analysis is ungeneralised and incidental to the main problem and explanation of distribution, or to what Stigler has called his " basic theorem on distribution ", that a rise of wages would invariably lower profits.[2]

It may be interesting, but is certainly only speculation, to wonder whether Ricardo would have been as completely impervious to the (neo-classically " correct ") views of Bailey, Senior and Longfield as were his disciples, including J. S. Mill, who survived him, and whether or not if he had lived on to the 1840's, and had discovered the book, he would not have been more interested in Cournot's *Recherches* than in the early works of Marx. But if the ideas of Bailey, Senior, Longfield, and Cournot had convinced Ricardo at all, he would have had to have turned the design and structure of his *Principles* upside down and inside out—however many particular bricks and materials might have been valuable in re-erecting a new structure on something more like neo-classical lines. He would have had to remove from its leading position that problem of class distribution which because of the Parliamentary debates of 1815–16 had struck him as " the principal problem in Political Economy ". If one wishes to play down the revolutionary novelty of the neo-classical system inaugurated by Jevons, and emphasise its continuity with what had gone before, one can cite such predecessors as Steuart, Senior, and Longfield, the whole of " the French school " (with whom Jevons said " the truth lay "), and the German school of Hermann, Thünen, and Mangoldt. One can mention also *parts* of the works of Smith, Malthus, and J. S. Mill. But surely the very last great name one could conceivably mention as a forerunner of, or contributor to, the neo-classical analysis of value and distribution is that of Ricardo.

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[1] Vol. I, p. xlviii—p. xlix.

[2] *Journal of Political Economy*, 1952, p. 203.

III

We have been concerned mainly with Ricardo's discussion of the problems of value and of his principal subject—that of distribution between classes. However important and original his contributions to the theories of international trade and money may have been, it is his analysis of what he considered " the principal problem in Political Economy " which must surely be taken as the main item in considering his work. But it might well be contended that Ricardo's general contribution to the method and technique of economic analysis should be regarded as of much more significance than his doctrines on any particular problem, including those on his ' principal ' problem. Even if it were agreed that he chose as the principal problem around which to build his political economy a rather intractable conundrum, to which comparatively little in the way of answer or even of attention has since been given by most orthodox economists, was not Ricardo the great pioneer and developer of the method of abstract analysis adopted by *all* subsequent theoretical economists, whatever their purposes and problems? Here we are on the verge of controversies even more severe than we have been in discussing other aspects of Ricardo's works. There is, for example, on the one hand, the point of view expressed in our contemporary *The Economist*, which writes: "The classical economists, and *Ricardo in particular*, *discovered* something more important than any single generalisation; they discovered *the technique of economic analysis* itself."[1] Here, however, on the other hand, is Schumpeter's very different account of Ricardo's methodology: "The comprehensive vision of the universal interdependence of all the elements of the economic system, that haunted Thünen, probably never cost Ricardo as much as an hour's sleep. His interest was in the clear-cut result of direct, practical significance. In order to get this, he cut that general system to pieces, bundled up as large parts of it as possible, and put them in cold storage—so that as many things as possible should be frozen and given. He then piled one simplifying assumption upon another, until, having really settled everything by these assumptions, he was left with only a few aggregative variables between which, given these assumptions, he set up simple one-way relations so that, in the end, the desired result emerged almost as tautologies. For example, a famous Ricardian theory is that profits 'depend upon' the price of wheat. And under his implicit assumptions and in the particular sense in which the terms of the proposition are to be understood, this is not only true, but undeniably, in fact trivially, so. Profits could not possibly depend upon anything else, since everything else is 'given', that is frozen. It is an excellent theory that can never be refuted and lacks nothing save sense. The habit of applying results of this character to the solution of practical problems we shall call the 'Ricardian Vice'."[2]

Which do we owe to Ricardo, "the technique of economic analysis", or "the Ricardian Vice", or *both?* This is clearly a fundamental question which arises in considering Ricardo's work, and though it may be one on which agreement is unlikely and unnecessary, surely some greater degree of clarification may be possible and desirable. We shall only make two brief points before changing the subject. In some of his monetary writings (e.g. the Reply to Bosanquet) there is much of what Professor Sayers (in an unpublished paper) has called " that skilful analysis of detailed fact in which Ricardo so obviously revelled ". But we presume that however outstanding this mastery there is hardly here a *discovery* of a technique to be attributed to Ricardo. What *is* new in Ricardo is, of course, the technique of analysis deployed so exclusively throughout the *Principles*. This is very different from much of the analysis in the monetary writings because there is hardly a " *detailed fact* " mentioned, much less analysed, from one end of the *Principles* to the other.

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[1] See "The Scholar's Ricardo", *The Economist*, Sept. 1st, 1951, p. 502—italics supplied

[2] *Quarterly Journal of Economics*, 1951, p. 160.

Secondly, though Ricardo's example contributed overwhelmingly to what became an orthodox approach on scope and method, in the systematising and arranging of the body of orthodox economic theory in the 19th century (which left out so much of what was best in 18th century theory), J. B. Say's *Treatise* has an earlier and important place—quite apart from the fact that its content on value and distribution is much more in accordance with neo-classical principles. J. B. Say, incidentally, strongly critised Ricardo's excessive use of abstraction.

IV

Above, we have only mentioned the longer-term influences of Ricardian theory. Let us by " successive approximations " approach to its contemporary setting, to its contributions on policy, and to Ricardo himself. What of the short-term history of his school, and of Schumpeter's conclusion that " Ricardianism " was " no longer a living force " in 1830 ? The original and sole true-blue party of Ricardian economists may be said to have comprised James Mill and McCulloch, accompanied, perhaps, part of the way by Mrs. Jane Marcet and Miss Harriet Martineau, with de Quincey as rather an odd man out. On the other hand, nearly all the great economists of the second quarter of the 19th century, especially those regarded as significant and original today, abandoned the main Ricardian questions and the main Ricardian answers (with the very doubtful exception of J. S. Mill). The obvious examples are Bailey, Longfield, the Oxford group of Whately, Senior, and Lloyd and also Richard Jones (who *even more* than Ricardo has the distinction of having been greatly appreciated by both Marx and Marshall)

—to take only the main English names. The triumphant process by which it came about that Ricardo's name remained for so long one to conjure with in the most influential circles in Parliament, the political clubs, and the heavyweight Victorian reviews, still needs much elucidation and documentation. However, within ten or twelve years of Ricardo's death those today regarded as the most important economists were asking, on the whole, very different questions about value and distribution, and were certainly propounding very different answers, from those to be found in his *Principles*. And it is *their* questions and *their* answers on these central subjects—and not Ricardo's—which, for better or for worse, have been adopted by subsequent generations of economists. What remains of Ricardianism in John Stuart Mill's *Principles* is left to survive, if possible, in company with massive influences, both on the analytical and the political side, deriving from almost diametrically anti-Ricardian sources.

Arriving back then, at Ricardo's contemporary entourage it is perhaps interesting to speculate how long he and his immediate supporters would have kept in step if he had been granted, as he well might, another twenty years of work and thought. Ricardo never got to the point of complaining of " modernist stuff turned sour and silly "—though the 1820's were presumably no more free from such material than other decades. He was, however, already apt to cause considerable dismay to his more dogmatic and rigid disciples when his search for the truth led him to an abrupt and fundamental change of front—as in the case of his *volte-face* over the effects of improved machinery on wages. McCulloch then accused him of inciting the Luddites, and complained of " the extreme erroneousness of the principles to which you have incautiously lent the sanction of your name."[1]

In any case, Ricardo surely had a type and quality of mind very different from those who were both his disciples and his mentors. Ultimately, and almost completely unconsciously, Ricardo seems to have been working towards intellectual objectives very different from those of the London-Scottish propagandists and best-selling female popularisers, with whom he or his doctrines were associated. Schumpeter has said of Ricardo that his " was not the mind that is primarily interested in either fundamentals or wide generalisations . . . his interest was in the clear-cut result of direct, practical significance."[1] Though we would not be so sure about Ricardo's lack of interest in wide generalisations, this judgment may well contain much truth as to the Ricardians, and have a lot of truth even for Ricardo himself. But it is not *the whole* truth about Ricardo. Surely there is in Ricardo an obviously outstanding capacity and also inclination for profound and disinterested analysis, the development and unfolding of which was so seriously hampered by his extreme philosophical naiveté, his literary incapacity (though he was a forceful speaker), and some of the intellectual company which he kept and which influenced him most. The best side of Ricardo comes out in his letters to Malthus—that is, apart from his prodigious analytical gifts (the sort of gifts which are, however, in themselves intellectually neutral, and which, undisciplined and unguided, may, and often do, produce much more harm than good). These letters give an inspiring record of disinterested and tolerant enquiry by two people of quite different views. One has only to contrast Ricardo's temper in this correspondence with that of McCulloch, who urged on him the need for an aggressive condemnation of a new publication by Malthus, before even he (McCulloch) had any idea of what this publication was about.[2]

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[1] Introduction to Vol. I, p. lviii.

Certainly from its beginnings, and over by far the greater part of his work, however abstract his method, Ricardo is heavily engagé, shaping his analysis and directing his arguments straight at topical events. Philosophically innocent to the point of complete nullity, he remained unaware of any contrast, which required a subtle and disciplined process of reconciliation, between the criteria and objectives of political arguments on topical issues, and the maximum humanly possible detachment in enquiry after, and presentation of, the truth (or in the avoidance of error). Such a distinction probably never made much of an impact on Ricardo, and certainly his main philosophical and political mentors had no interest in his perceiving and advancing to any such distinction. But there are signs, for example, in the correspondence with Malthus, that Ricardo was being led in the direction of a certain critical awareness of the significance, and vast practical limitations, of what he was doing. There is, for example, the following well known passage which shows at least the beginnings of the sort of indispensable self-criticism which might have developed much further had Ricardo had more time and a more favourable intellectual environment: "It appears to me that one great cause of our difference in opinion on the subjects that we have so often discussed is that you have always in mind the immediate and temporary effects of particular changes, whereas I put these immediate and temporary effects quite aside, and fix my whole attention on the permanent state of things which will result from them. Perhaps you estimate these temporary effects too highly, whilst I am too much disposed to undervalue them."[1]

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[1] *Quarterly Journal of Economics*, 1951, p. 160.

[2] See Introduction to Vol. II, p. viii: "I think that justice will not be shown either to the science or the country if it be not handled pretty roughly". The invocation of "justice to the science" and even of that last refuge, patriotism, is noteworthy. Even a quarter of a century later, in his otherwise valuable work on *The Literature of Political Economy*, McCulloch was still describing Malthus' theories (apart from his population theory) as "feeble", "futile", etc.

But the influence of Malthus' criticisms was slight compared with the aggressive and intolerant insistencies of James Mill. Undoubtedly, of the many new documents this edition will have published, it is the correspondence with James Mill which many will read with the most interest—perhaps with even more interest than Malthus' letters. But Mr. Sraffa, by various quotations in his introductory notes, makes clear the main pattern of the Mill-Ricardo relationship. He confirms that James Mill was the main driving force throughout Ricardo's extraordinary and meteoric 14 years as a writer on, or propagator of, political economy (of which 14 he was still amassing or consolidating a fortune for about six, and was a busy and dutiful M.P. for another four). Acting as a mixture of professorial supervisor and political impresario, James Mill pushed forward the reluctant and hesitating Ricardo at each main juncture, getting him to propagate his "New Political Economy" first in a formal treatise of Principles, and then from the stage of the House of Commons. Describing the composition of the Principles, Mr. Sraffa writes: "We find Mill assuming the role of 'schoolmaster' and commanding Ricardo 'to begin to the first of the three heads of your proposed work, rent, profit, wages—viz. *rent*, without an hour's delay.'"[2] There was certainly much of the dogmatic doctrinaire dominie about James Mill, and much of the student prodigy about Ricardo, who, though in his forties, and a near-millionaire, was in education, philosophy, and skill in literary composition, not exactly mature or sophisticated.

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[1] Letter of Jan. 24th, 1817, to Malthus.

[2] Vol. I, p. xiv.

It is very similar with Ricardo's entry into Parliament. Again it was James Mill and various associates who pushed Ricardo into the House of Commons, for him to become there "The Oracle" as Cobbett called him, propagating among other questionable doctrines, Say's Law of Markets, and the Treasury View. Thus Ricardo was brought to spend in this way so much of his last few precious years which might have been very well spent on a critical revision and clarification of his *Principles*. The negotiations which finally led up to the five-figure transaction by which Ricardo obtained his seat were entered into without his knowledge. It is true that he had written in 1818: "If I could, without much trouble, get into the New Parliament, I would."[1] But this confession hardly has the ring of one suffering from an acute sense of political mission, or from that Utilitarian craving to make everybody happy by a not-easily-adjusted combination of mathematical or geometrical analysis and legislative action.

Nevertheless, despite his propagation of the Law of Markets, of the assumption of full employment, and of the Treasury View, and of the other doctrines of his "New Political Economy"—(including, for example, the clear-cut theories of international trade, the consequences of which are still so fundamental for Britain in the 1950's), the Hon. Member for Portarlington by virtue of those very qualities which so distinguished him from some of his associates, by the example, that is, of his natural intellectual modesty, detachment, and fair-mindedness, must have spread much sweetness and light among his fellow legislators, and it must be hoped even a net balance thereof. Let us, at any rate, end these questionings with this account of Ricardo in the closing phase of his life by a fellow M.P.: "His speaking, his conduct, his manner, were all unexceptionable, and all suited to the man, his high station among philosophers, his known opinions on political affairs, his kindly nature, and his genuine modesty. There was something about him, chiefly a want of all affectation as well as pretension in everything he said or did, that won the respect of every party. His matter was ever of high value. Whether you agreed or differed with him, you were well pleased to have it brought out and made to bear upon the question, if indeed the pursuit of right and truth was your object".[2]

The London School of Economics.

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[1] Vol. V, p. xix.

[2] Vol. V, p. xxxii.

Book Reviews

Introduction to Statistical Method. By B. C. Brookes and W. F. L. Dick. Heinemann. 1951. viii + 288 pp. 21s.

" A knowledge of the elementary principles and techniques of statistics is becoming a necessary part of a well-balanced education. As the basic ideas are not inherently difficult, and as they are certainly not beyond the grasp of any secondary school sixth form pupil, it is hoped that this useful branch of applied mathematics will find an increasingly important place in the school curriculum."

These are the views expressed in the Preface to this book and few would dissent from them. The School curriculum is already overcrowded and, if room is to be made for statistics, it can only be as part of the mathematics curriculum, both for those training as mathematicians and for prospective natural scientists or engineers.

The present volume is designed as a textbook for what might be called " sixth-form " statistics. The authors are well equipped for their task ; Mr. Brookes has had experience of sixth form teaching at Bedford Modern and is now a lecturer at University College, London, while Mr. Dick is a technical officer in a large industrial concern (Imperial Chemicals). They have written a book which can be commended not only for sixth forms at schools, but also for many others needing a first course in statistical techniques.

There will be little disagreement with the general order and method of treatment adopted. After three chapters on frequency distribution, averages and dispersion, an attack is made (chapter IV) on the ideas of probability, including that of random sampling which it is good to see introduced so early. The next two chapters, which bring Part One to a conclusion, deal with the binomial, Poisson and normal distributions. It is to be noticed that Part One is also published separately from the more advanced sections. The later chapters cover tests of significance and particularly the use of the t-test (chapter VII), regression and correlation (chapters VIII and IX) and goodness of fit and the use of χ^2 (chapter X). Finally there is a general description (chapter XI) of experimental design, with pointers on such topics as analysis of variance, Latin Squares and factorial design.

Two important subjects get scarcely any mention at all. One is the theory of index numbers, to which one section of two or three pages is allotted, including the only reference to geometric means. The other is the analysis of time series, with an equally short section devoted only to the method of moving averages. There are one or two illustrations of the graphing of time series. The explicit recommendation is that a total should be plotted at the end of the period to which it relates whereas an average should be put at the centre; it is difficult to see why a total is treated differently from an average and the practice, in certain cases, could be definitely misleading.

The authors state that they cover the methodological part of the Royal Statistical Society Certificate Examination. It is true that the book provides a basic text for the Certificate—and can be recommended as such—but it is not true that it is a sufficient cover. It needs to be supplemented by collateral and further reading. The text does not deal adequately either with index numbers or with time series, as has been noted, and it fails to cover certain other parts of the Certificate syllabus such as curve fitting, interpolation and quality control.

A few criticisms on points of detail are offered in the anticipation that the text will go through several editions of progressive improvement and expansion. On page 3, the reference to " Monthly Statistical Abstract " is a confusion between the monthly Digest and the annual Abstract. Only graphical methods are given for estimation of medians and quartiles from frequency distributions and it is recommended that the cumulative graphs be smoothed for the purpose; this should be supplemented by giving the arithmetical process without smoothing. The semi-interquartile range is also called the quartile deviation and this should be noted. Some diagrams (e.g., Figs. 20 and 21) do not make it clear exactly what figures are plotted. Chapter VII gives the method and illustrations of testing differences between means and variances but it does not give the appropriate tests of differences between proportions found in samples. In the text, the Poisson chart and tables for normal areas and for t and χ^2 are given at the appropriate places; these are very usefully reproduced also in an Appendix. However, the table for t is given for both tails without an accompanying diagram to illustrate, whereas the tables for normal areas and for χ^2 are for one tail with illustrative diagrams; this is a little confusing. Further, tables for z or F, either at the 1 per cent. or the 5 per cent. points, or both, could have been added with advantage.

R. G. D. ALLEN.

Index Numbers. By BRUCE D. MUDGETT. John Wiley, New York. Chapman & Hall. 1951. x + 135 pp. 24s.

The theory of index numbers is generally framed in terms of a comparison between two periods only and it leads to the derivation of formulæ such as those of Laspeyres and Paasche and the various ' crosses ' between them. This is directly applicable when, in practice, a link is required between commodity prices and quantities in two years which are sufficiently remote so that full data are available. Professor Mudgett does not add much to our knowledge here. He does well to stress that index numbers are generally (though not inevitably) required to split a value change between two periods into the product of price and quantity changes, and that the value change can be specified for this purpose in one of three ways. It can relate to the value of all commodities, or of all commodities common to the two periods, or of a sample of commodities common to the periods. Usually index numbers are compiled on the third basis but, by the use of comprehensive weighting, they are intended to serve as an approximate split of the change in the value of all commodities.

The standard theory, however, is very limited in its applications. The practical problem is generally to construct a run or series of index numbers, e.g. at monthly intervals. Further difficulties then emerge. There are many weighting systems which can be used in such a series, and not just two as employed in the Laspeyres and Paasche formulæ. There is the need to keep the series up to date (e.g. for the current month) so that the Paasche index is seldom either a desirable or a practical form. These difficulties are not usually examined by index number theorists. Professor Mudgett is clearly aware of the problems but he does not make them sufficiently explicit and he devotes only one short chapter to them. The practical solution is never easy to find and it must vary with the type of index number considered. For example, in an index of retail or wholesale prices, the best solution may be to use the Laspeyres index with a change of base every so often—perhaps at intervals of five or ten years, perhaps in the form of a yearly chained series.

A series of index numbers of Laspeyres form has a fixed weighting basis but can be written with any period as 100; it is of the type described by Professor Mudgett as "fixed-weight aggregative". He appears to take strong exception to this type of index and to consider that Mitchell, in recommending it, has led U.S. index number compilers into error. His argument is unconvincing, for it seems to confuse the weights base with the comparison base in a series of Laspeyres index numbers. The weights base is the essential feature of the series; the comparison base is the period which is written for convenience as 100 and this can be changed at choice by simple division through the series. To quote two actual examples, the British interim index of retail prices has 1937–38 as weights base but it is written with June 1947 = 100; the B.L.S. index of U.S. wholesale prices has 1929–31 as weights base but 1926 = 100 is the comparison base. These examples illustrate that it is often desirable to have a comparison base different from the weights base, particularly if the latter is an average of years; this is, in fact, all that Mitchell recommended.

Professor Mudgett concludes with three chapters, of a historical and critical nature, on the two American index numbers of prices (at retail and wholesale) which are at present under revision. These are of limited interest to British readers, as indeed is much of what is included elsewhere in this monograph.

R. G. D. Allen.

The Theory of Inter-Sectoral Money Flows and Income Formation. By JOHN SOMERSET CHIPMAN. The Johns Hopkins University Studies in Historical and Political Science, Series LXVIII, No. 2. Baltimore. 1950. 154 pp. $2·00.

In the past few years the Keynesian theory of the multiplier has been greatly improved by generalisation to a multi-sector economy and relaxation, in the dynamic formulation, of the assumption of a single income-consumption lag. The result of this development has been the emergence of a new and powerful analytical tool, the matrix multiplier, whose potential applications extend far beyond the context of the original problem. In this book Dr. Chipman, who shares with Professors Goodwin and Metzler the credit for the innovation, presents within a broader historical and methodological framework his previously published works on the subject.

Part I discusses in non-mathematical terms the structure and application of the multi-sector model. This section contains two interesting analytical devices. The first is the introduction of a " Finance " sector, which provides a formally adequate if institutionally unsatisfactory answer to the old objection to multiplier theory, " where does the money come from ? " The second is the insertion of " goblins " (collecting agencies) to allow differences in time-lags. Dr. Chipman's continued use of the term " marginal propensity " for functional relationships between receipts and spendings, however, is regrettable, since these functions in many cases lack the original Keynesian psychological content ; this is particularly true of the " marginal propensity to spend eventually ", a confusing description of the proportion of a sector's receipts which percolates into another sector.

Part II presents a geometric and algebraic analysis of the two-sector case ; the geometrical model is unnecessarily complicated. Part III is concerned with the mathematics of the multi-sector multiplier ; this is difficult stuff, and the author's notation is rather clumsy, but the exposition is remarkably clear. (Equations 6·46 and 7·16, however, are obviously inaccurate.) Most of this material has appeared in *Econometrica ;* but the author has included a section which brings to a satisfactory conclusion the *Economic Journal* controversy as to whether the matrix multiplier oscillates.

This should be a useful book for the specialist in multiplier theory ; even the non-mathematician can benefit from the lucid exposition of Part I (although he may disagree with the author's version of classical theory on p. 35). Its usefulness might have been improved, however, by the inclusion of a few economically meaningful theorems. For example, if all sectors have total marginal propensities to spend less than unity, an injection in one sector will raise its receipts by more than would the same injection in any other sector—a theorem with obvious applications to such problems as the choice between public works and relief, or the planning of international investment.

HARRY G. JOHNSON.

Introduction to Economics. By A. CAIRNCROSS. Second Edition, 1951. Butterworth & Co. Ltd. 592 pp. 18s. 6d.

The first edition of this textbook appeared in 1944. It lacked balance in that too little attention was accorded to the general theory of value and to unemployment and foreign trade, and too much to the problems of industrial organisation. Its most serious defect, however, was its wizened appearance and cramped text. Professor Cairncross's publishers have wholly overcome this defect in this new edition, and deserve congratulation on the success of their efforts to make his work available to a wider public.

The content of the new edition is more balanced. The chapters on foreign trade, location of industry and unemployment have been expanded, and the treatment of the general theory of value has been simplified and extended. Two new chapters have been added on the technique and uses of social accounting. The chapters on money and banking have been cut, and the treatment of industrial organisation curtailed.

The contents of this volume are excellent, and are characterised by an admirable integration of economic principles with economic experience. Nevertheless, it is difficult to decide to whom it should be recommended. The general level of the treatment is perhaps rather difficult for non-specialist students who want their economics from a single textbook. The analysis is not sufficiently rigorous for students who intend to specialise in economics, for the author has made no attempt to over-simplify. The book, however, can be recommended whole-heartedly to students already acquainted with basic economic principles, but who are confused about the relation of the principles to the practice. In Professor Cairncross's work they can observe the tools of economic analysis being used with superb skill and effect.

W. J. L. RYAN.

The Changing Culture of a Factory. By ELLIOTT JAQUES. Tavistock Publications Ltd. 1951. xvii + 336 pp. 28s.

This book makes a contribution to our understanding of industrial relations. It is a report by a psychologist who, as leader of a team from the Tavistock Institute, was admitted to collaborate with Glacier Metals as a firm " interested to study and develop its methods for creating satisfactory group relations ", and who, once there, was invited by various groups to serve them as a therapeutic consultant. It describes some of the changes in structure and human relations during three years' eventful working of a London factory. But it does so always in terms proper to a consultant bound by an obligation of confidence to his clients, and this imposes some colourlessness of treatment, which perhaps accounts for it not being an easy book to read. Yet on the internal evidence it commands the reader's respect, as a modest and scrupulous study in observation and interpretation, which despite its having an unusual story to tell makes no hasty or dogmatic claim.

The story is unusual because of what the firm was to start with, and because of the approach of the consultant. In its engineering work the firm was like many others, but it was exceptional in the attention its folk paid to human relations. There were " social developments which have been in advance of demands by employees ". In a statement issued in 1950 the purpose of the company is defined as " the continuity and expansion of a working community, the conditions of which will enable its members to serve society, to serve their dependents, to serve each other, and to achieve a sense of creative satisfaction ". It appears clearly enough that the influence underlying this is the personality of the managing director, but perhaps it is again a limitation of the therapeutic role that the author does not directly describe this influence, or consider how much of what went on depended on it.

The consultant, too, was not of the usual kind. He had been invited not by management only but by the Works Council, and he was there not to do a job for management, but to study the emotional forces underlying industrial relations, and then later, when some groups asked him to help them, to serve in his professional capacity as a psychotherapist. He understood this to impose on him the obligation to enter into no relation with any one group that could be exclusive to any other ; and to offer no solution to the problem a group was tackling, but only to help its members realise some of the underlying feelings which might be impeding their work on it. " The function of the consultant was to make such observations as would help those concerned to recognise some of the less apparent factors affecting the immediate situation, particularly the stresses in the face-to-face group. There was resistance to his interpretations, varying from polite denial or ignoring of his remarks to expressed annoyance or irritation. Where he felt justified, he used these reactions to himself to show the group how uncomfortable they felt about their own relationships, and that they were transferring on to him, as the person bringing these problems into the open, their own attitudes towards each other." With this help the group resolved some of its problems by ' working through '—the recurrent word for the way in which a group, while tackling a practical problem, at the same time makes the effort to recognise, and bring out into the open, underlying motives which affect its approach, and thereby acquires " a better capacity to tolerate initially painful insights into phenomena such as scape-goating, rivalry, dependency, jealousy, futility, and despair, and thence a greater ability to deal effectively with difficult reality problems ".

The account of what this brought out is often interesting : for example, the forces that make both workers and management want to keep open the split between them which consciously they regret. An important place in the literature of joint consultation belongs to the account of how a new understanding of the executive and consultative functions was worked out here.

This study has the controversial attributes of pioneer work. To one reader at least it commends itself as a thoughtful endeavour to throw a new kind of light on industrial relations, and as the record of a remarkable attempt to work out better relations within one firm.

E. H. Phelps Brown.

History of the Second World War—Food. Vol. I—"The Growth of Policy". By R. J. Hammond. H.M. Stationery Office, and Longmans. 1951. xii + 436 pp. 25s.

The ideal historian, who is seldom encountered, must be more than a man. The perfect official historian must be one half genius and one half diplomat; perhaps because the gods are less prone to seek relaxation along the corridors of the Foreign Office than upon the hills of Greece, he is even rarer. Mr. Hammond is an historian of standing and repute: one feels that in this work the historian has been handicapped to some extent by the burden of diplomacy which he has had to carry. Moreover, he has been overridden by the general editor of the series in his wish to postpone the publication of this 'policy' volume until after the studies of administration and control designed for the second volume had been finished. As the war-time policy of the Ministry of Food, like that of the war-time Prime Minister, was 'to wage war with all means at its disposal' rather than to pursue as ends in themselves such objectives as the introduction of economies into the food trades or the achievement of standards of nutrition, all its decisions of moment arose out of problems of administration. This is indeed the general conclusion one derives from the book, and it is some measure of the author's success in a difficult task that he succeeds in conveying it so clearly, despite the fact that he has had to put asunder, to some extent, two aspects of events which the pressure of war-time administration joined together so closely that, to those who took part in them, they appeared inseparable.

The first part of the book, dealing with the preparatory measures and discussions which took place before the war, is an admirably lucid and well balanced narrative. The second, which deals with the first year of the war, is, like the period of experiment and confusion which it portrays, less easy to evaluate. The section entitled "The Beginning of Rationing" is of great interest, and the account of the great debate in which those problems of transport, which later were to loom so large, cast their shadows before, is most illuminating. The first Minister of Food, Mr. W. S. Morrison, emerges from these chapters with an enhanced stature.

The next part uses the situation caused by the air-raids of 1940–41 as its point of departure for problems of internal policy. Food prices and stabilisation policy, in which, as the author rightly says, there was no break from 1941 until the end of the war, receive their fullest treatment here, although they come up again in later sections. The fourth and final part, covering the remainder of the war, hinges upon the situation and problems created by the spread of the war after Pearl Harbour. Inevitably it spends more pages upon external affairs, particularly the development of the Combined Food Board, than the earlier parts, but it also pursues such internal developments as the introduction and development of points rationing, the concentration of the food industries (upon which some new and most interesting light is shed) and the pursuit of economy in internal transport.

Taken together, the whole narrative, of which the preceding paragraphs are only intended to indicate the *arrangement*, covers all the manifold activities of the Ministry during five crowded and eventful years. It shows food policy developing from the early days in which a minority of foodstuffs were controlled in price to the concluding stages, in which some 95 per cent. by value were subject to maximum price orders ; as a corollary to this it traces the development of rationing. It follows the changes in food supply from the easy days of 1939 through the period of shrinking import programmes to the black days after Pearl Harbour and the subsequent recovery. These two movements alone raised a host of policy questions. On what basis were maximum prices to be fixed ; how were margins to be allocated between the successive stages of distribution ? What was the best method of organising rationing ? Should the system be unitary or complex ; should all foods be rationed, and rationed equally, or should rations be adjusted to physical needs, or should there be a wide margin of unrationed supplies ? How were restricted shipping allocations to be distributed between animal feedingstuffs and human food : in the latter, what nutritional balance should be aimed at ? All these and a host of minor questions had to be handled by what Lord Woolton once called " my motley army of business men and dons " (a definition unfair to the great share of the burden in fact borne by career civil servants), the organisation of, and distribution of authority within which, in itself presented great difficulty.

Is it possible to see in this record of crises and solutions any general principles of wider application ? The problem of economic planning with which the Ministry was confronted was both wider and narrower than that of planning for ' welfare ' in broad terms : wider, because the changing fortunes of war brought new problems every hour ; narrower because the objective was not ' optimum satisfaction ' but victory. But economic planning in general consists of setting the machinery of business to do other than it would do if left alone : it must get its facts and its men of action from the world of business ; it must, from some generally unspecified source, find administrators who can fruitfully cooperate with the experts and, at need, gracefully override them.

Lord Woolton's solution was two-fold; to move the balance of executive authority increasingly to the men of affairs, while introducing into the Ministry a general department of scientists and economists. To quote Mr. Hammond, this was designed as " more than a piece of administrative machinery; it was a symbol of the intellectual unity of food control. Its purpose had been to formulate a broad policy of food welfare, based on expert advice, and kept as a single whole under expert review. That policy might be said to have two distinct aspects. In the first place it strove to relate import, home production, and rationing programmes to objective standards of need; that is to say, it set up a clearly defined end that food control should seek. In the second place it aimed at securing the greatest possible rationality in the means used; to substitute foresight for improvisation, to keep one control in line with another, to avoid the contradictions that might arise from piecemeal or independent action." His verdict is that the department failed in the second field, despite its success in the first: that scientific advice tended to be utilised, economic to be disregarded. This is, of course, the normal course of events in the world in general. Mr. Hammond is quite right to list, among the reasons for this specific example of the general failure, the difficulty of cooperation between ' line ' and ' staff ' in any walk of life, and the need for the theorist to acquire some knowledge of the ' texture ' of matters in which he seeks to intervene. But for one reader at least this masterly record of events in which he took part would provide, added to its evocative power and its wealth of information, more help for the solution of this permanent problem of economic administration had its author been willing to indicate a little more clearly, in the light of his unequalled knowledge, where he felt the cause of the failure to lie.

HENRY SMITH.

The New Issue Market and the Finance of Industry. By R. F. HENDERSON. Bowes & Bowes. 1951. xii + 172 pp. 25s.

Mr. Henderson's book drives straight to the heart of the new capital market, not the least complex piece of our financial organisation, yet falls into no technical errors or naïveties. For reasons beyond his control, he has had to be content with statistics covering the period 1945–47, not very representative years in the post-war capital market. He notes a double change in the market since 1937 (the last period of activity before the war). First there has been an increasing tendency for small companies to come to the market. Secondly, the structure of the new issue market itself has changed, being broadened by the advent of the merchant banks, extended in scope by ' pre-natal ' activities by such concerns as the Industrial Commercial and Financial Corporation, and the Glasgow Finance (Development) Co., and strengthened by the disappearance of the pre-war " mushroom " new issue house.

Mr. Henderson finds that the efficiency of the market has been improved by these changes. Costs of offers for sale and public issues, which tended to be unduly expensive where small companies were concerned in 1937, have come down, although the cost of placings may have risen. In any case Mr. Henderson suggests that the initial costs incurred by the small company in " coming to the market " cannot be regarded in isolation but must be regarded as a species of non-recurring entrance fee to a club, membership of which enables subsequent issues to be made more cheaply. Because of a tendency to weight the scales against the small newcomer, Mr. Henderson favours an extension of the ' pre-natal ' facilities by I.C.F.C., the institutional investor and the hire-purchase firms, in order that companies may be more mature before their securities are offered to the public.

Although its primary use will doubtless be to students, the City should enjoy reading this book for it will find rationalised therein many conclusions it has reached empirically. Company directors who carry to extremes the policy of hoarding undistributed profits may also be recommended to study Mr. Henderson's comments on the stultifying effect of such a policy on the capital market and the nation's investment programme as a whole. Politicians may ponder Mr. Henderson's rejection of the thesis so dear to them, that " consumption can be planned and industrial production and investment dovetailed into that plan without much difficulty by the use of physical controls and without the assistance of that old-fashioned instrument the rate of interest ". They should also note his fears that the small speculative business, on which an expanding and progressive economy depends, is being starved of risk capital. For economists the work fills an undoubted gap in a sphere which is none too well signposted. It is to be hoped that Mr. Henderson will return to the subject—at regular five-yearly intervals if the trade cycle, and hence the new issue cycle, continue to be conspicuous by their absence in the British economy, or at an appropriate interval after each new issue boom if they don't.

HAROLD WINCOTT.

The British Banking Mechanism. By W. MANNING DACEY. Hutchinson's University Library. 1951. 203 pp. 8s. 6d.

This book is welcome. Mr. Manning Dacey provides not only an accurate up-to-date description of the British banking structure, but also some shrewd comment on monetary policy. His thorough knowledge both of the details of the money market and of its significance in the economic system is apparent throughout, and is matched by an easy style. One illustration of this is his description of the difference between day-to-day " credit policy " and " monetary policy designed to secure positive results over a longish period " (page 31) and of the practical difficulties which arise from their interdependence.

But the monetary mechanism is composed of so many interdependent parts that to explain it *ab initio* is far from easy. If the student or intelligent layman, to whom, according to the dust cover, this book is addressed, has no previous knowledge of the subject he will find it hard going. For the main description of the basic structure of the banking system is squeezed into one short chapter; and in explaining the key table 1 (which is printed in such a way that the book has to be turned round each time one refers to it) the author adds to the difficulties of the beginner by a digression that uses figures not included in the table (page 26).

A few other points deserve reconsideration in subsequent editions :— " the marginal efficiency of capital " surely does mean more than " the level of business confidence " (page 143 note); the cryptic summary of the discussion on the assets structure of the clearing banks needs amplification (page 100); so does the description of war finance and inflation presented in the table on page 163.

Second-year students, however, and many others will learn much from this book; not the least of its virtues is that it can hardly fail to stimulate its readers to further thought and discussion.

RONALD F. HENDERSON.

Wages Policy under Full Employment. Edited by RALPH TURVEY. William Hodge & Co. 1952. 88 pp. 6s.

Mr. Turvey has given us a very welcome and very readable translation of a group of essays written between 1948 and 1950 by four Swedish economists—Professor Erik Lundberg and Messrs. Rudolf Meidner, Gösta Rehn and Krister Wickman. The four writers are agreed on a number of fundamental points—the evils of detailed government controls, the virtues of the price mechanism and the need to maintain " full employment " with a stable price level. Unfortunately, however, they do not attempt a definition of the much abused words " full employment " and this robs the argument of some of its precision.

Professor Lundberg begins the discussion by distinguishing between the two ways in which the fruits of increased efficiency may be distributed, stable wages and falling prices or stable prices and rising wages. The latter is taken as the basis of discussion in later articles, where it is generally assumed that increases in wages which are matched by increases in productivity are natural, and increases above this point are called " excessive " or " unreasonable ". Mr. Meidner follows with a critique of some previous writings in which he shows up a number of weaknesses without doing much to correct them. The constructive suggestions all come from Mr. Rehn, and it is his articles and the criticism of them by Professor Lundberg which are the heart of the book.

Rehn postulates as necessary conditions of a good wages policy that the structure of relative rates should be acceptable, and that profits should be low enough to be acceptable to trade unionists on the one hand, and to stop firms from bidding up wages in the labour market on the other. This implies the holding down of effective demand, when necessary, by the government, and Mr. Rehn suggests the use of a budget surplus raised chiefly from indirect taxes. It will be necessary to keep total demand at a level at which unemployment will appear from time to time in particular industries and areas, and the government should deal with this by encouraging mobility (an interesting suggestion is that of payments for change rather than movements in the general wage rates of whole occupations) and by subsidising sub-marginal firms. Within such a framework, the Trade Union Congress should assume greater responsibility for explaining the economic situation and disuading unions from " unreasonable " claims. In the last resort, however, it must be made clear that " the State guarantee of full employment is not unconditional ", i.e. if faced with unreasonable demands the State would have to maintain price stability at the cost of employment stability. The difficulties of this plan are subjected to penetrating analysis by Lundberg, but unfortunately he has no constructive alternative to offer. The book is an interesting and welcome contribution to the discussion of a difficult problem, but it will prove disappointing for those who come to it in search of practical advice.

E. VICTOR MORGAN.

Central Banking in Undeveloped Money Markets. By S. N. SEN. Bookland Ltd., Calcutta. 1952. 246 pp.

This is an admirable little book, the product of a great deal of painstaking research and hard thinking but eminently readable and readily comprehensible, a boon alike to the expert and the beginner. Though it deals with a topic which has already received considerable attention, it makes important new contributions : as Professor Sayers says in a note on the dust jacket, " In its comparative review of the recent technique of central banks all over the world, it breaks new ground and constitutes a most interesting development in monetary economics ".

Dr. Sen limits himself mainly to the Commonwealth countries and Latin America, but within this field covers the whole range of central banking techniques, with the exception of exchange control. He deals, for example, with rediscounting practices, open market operations, and variable reserve ratios ; with the direct control of commercial banks' assets, qualitative credit control, and the control of interest rates ; with the Australian Special Accounts and the commercial banking activities of central banks.

Always we find Dr. Sen well informed, lucid in his analysis, sensible and practical in his recommendations. It is to be hoped that his work will enjoy the popularity it deserves.

BRIAN TEW.

Monopoly and Free Enterprise. By GEORGE W. STOCKING and MYRON W. WATKINS. The Twentieth Century Fund. New York. 1951. xiii + 596 pp. $4.

This useful volume contains two contributions. The main part is a study by Professors Stocking and Watkins of the monopoly problem in the United States; it is followed by a forty-page report, entitled " A Program to Promote Competition ", prepared by a Committee on Cartels and Monopoly appointed by the trustees of the Twentieth Century Fund. The Committee consisted of members with experience in public administration, labour organisation, agriculture and business and included the distinguished economist, Professor Jacob Viner.

The study by Stocking and Watkins covers a vast field, extending from a consideration of recent developments in the theory of imperfect competition to the law relating to monopolies and patents and including some quite detailed examination of particular industries. It is a measure of the authors' achievement that they appear to be at home in each diverse part of their whole subject and that they frequently bring fresh insights into the interpretation of material which, to the student of the monopoly problem, is often familiar and well worked. Because of its scope it is difficult to review the book briefly; and it must suffice to record that of its kind it is excellent.

The British student of the structure of industrial markets and of the control of monopoly is likely to find the work generally of much interest. The Committee's " Program " is likely to be of even greater immediate interest because of its recommendations concerning the appropriate way in which the state should deal with monopolies.

One of the Committee's main recommendations is that the law should distinguish between cases where great size of firms and substantial concentration may serve the public interest and others where they may not. The ' rule of reason ' developed in the judicial interpretation of the Sherman Act should be clarified and made explicit, and become part of the anti-trust statutes or be applied in cases brought before the courts. " The real test of the reasonableness of the position occupied by a large-scale enterprise should be that of its performance in the public interest . . . The agencies of enforcement should attempt a painstaking formulation of criteria of the public interest and a thorough development of tests of industrial performance. These criteria should be applied and the results of these tests set forth in briefs presented by the government and their validity submitted to the determination of the courts . . . . The Sherman Act might be amended to establish a rebuttable presumption that concentration exceeding a specified percentage of the market for any product, or related group of products, was prejudicial to the public interest."

The recommendation, baldly summarised above, shows some similarities with the approach adopted in this country in the Monopolies Act, 1948. It is important because of the apparently complete change it urges from the basic approach contained in the Sherman Act and later American legislation. The Committee is aware of the difficulties of evolving standards of social performance, but does not think they are insuperable. However, this is not the most serious obstacle. Even if standards were determined and ranged and weighted in an agreed order of their importance, the problem remains of determining whether alternative arrangements in the market (e.g., a different number of sellers) would produce (or would have produced) a better or a worse performance than the present one. It is not obvious that the courts, in criminal proceedings, are equipped to make the required assessment of the conflicting ' evidence ' that would be presented. It is relevant to quote Mr. Justice Frankfurter in a recent anti-trust action in the U.S. Supreme Court. Dealing with the question of whether a certain marketing practice should be held illegal, he stated that " to demand that bare inference [that the practice tends to be restrictive] be supported by evidence as to what would have happened but for the adoption of the practice that was in fact adopted or to require firm prediction of an increase of competition as a probable result of ordering the abandonment of the practice, would be a standard of proof, if not virtually impossible to meet, at least most ill-suited for ascertainment by courts ". (*Standard Oil Company of California v. U.S.A.*, 337 U.S. 293.) Perhaps one may add that it is not certain that non-judicial bodies are likely to find it any easier to arrive at consistent assessments of whether an actual performance in known circumstances is better or worse than a predicted one in imagined circumstances. It would seem that consistency can be achieved only by reliance on some general theory of the relative merits of different market structures ; and one such theory, of course, underlies the present American anti-trust legislation.

In one important respect the Committee's proposals do not constitute a break with American anti-trust tradition. The Committee is firm that the trend towards the " increasing tolerance of restrictive programs adopted by particular producing groups " should be reversed " if the common interest is to prevail ". Many specific recommendations are put forward to strengthen anti-trust legislation, procedure and enforcement. It seems clear that the Committee is prepared to give large firms with monopoly powers a chance to justify the possession and exercise of their powers ; but this concession is to be applied in a general atmosphere of legislative hostility towards monopoly and restrictive practices.

B. S. YAMEY.

Federal Reserve Policy-Making—A Study in Government Economic Policy Formation. By G. L. BACH. Alfred A. Knopf, New York. 1950. xvii + 282 pp. $3·50.

In this study of the making of modern economic policy, the author has set himself two objectives : first, to give a detailed report of his extensive study of the process of forming Federal Reserve policy; and, second, to consider analytically the policy-making experience of the past twenty-five years, with a view to learning such lessons as experience can teach. However, economic policy is, as he says, " something hammered out, or arrived at by default of positive action, in negotiations among men representing different agencies, different interests, different points of view ". In these circumstances, as one would expect, it is difficult to provide a picture the generality of which will not be obscured by a host of exceptions. Further, even in the United States, where more publicity is given than in most countries to the discussions leading up to important decisions of central bank policy, there is much that an author of Dr. Bach's practical experience will want to say, but obviously cannot. For this reason the present volume is frustrating. Dark secrets are sometimes hinted at, but inevitably the author is forced back to the plane of safe generalisations. Still, in the general field of central banking, this is a different sort of book and deserves to be read both by those who wish to study the structure of the Federal Reserve system and also by those whose interests lie more in the field of public administration and the study of policy-making techniques.

J. S. G. Wilson.

The Growth of a Central Bank—the Development of the Commonwealth Bank of Australia, 1924–1945. By L. F. Giblin. Melbourne University Press, 1951. xi + 363 pp. £A1. 10s.

The story of the evolution of Australia's central bank is here told in detail for the first time, and it is with a sense of witnessing the lifting of a veil that one reads parts of this narrative. The book was written by one of Australia's greatest men, who was all too little known outside his own country, and the Bank was fortunate indeed to secure the services of the late Professor Giblin as its historian. Not only had he had a wide practical experience of Australian conditions but he brought to his task a considerable knowledge of some of the more important events and personalities of the period he has reviewed. In addition, Giblin had the advantage of full access to the records of both the Bank and (where relevant) the Treasury. The author has been an honest and careful chronicler and no higher tribute could be paid him. The account he gives is balanced and objective, though not lacking in critical perception, and in this book he has left for himself a worthy memorial.

Central banking in Australia has had a rather unusual history. The Commonwealth Bank was established as a trading bank and it still retains an active commercial interest. In 1924, there was a largely abortive attempt to convert it into a central bank by legislative fiat (an event which Giblin rather unexpectedly views with leniency), but the real story (and here the author's sense of emphasis must go unchallenged) begins with the depression years of the thirties. Previously only the chairman of the Bank Board—Sir Robert Gibson—seems to have had any very clear idea of what the Commonwealth Bank might come to be. After 1929, however, under the pressure of circumstance, the Bank began to grow like a living organism, adapted to its own environment and equipping itself to meet the specific problems of the economy it was called upon to serve. The process was accelerated by World War II, by the end of which Australia had a central bank *de jure* as well as *de facto*. " The period 1924 to 1945 was one of growth, adaptation and development, and the Commonwealth Bank Act of 1945 set legislative confirmation on the existence of a vital central bank individual in its character and techniques ". It is difficult to pick out highlights in this story, but Giblin's account of " central bank policy " during the depression does make one wonder how Australia ever climbed out of it. Another illuminating section gives us an inside view of how the old Commonwealth Bank Board actually worked. (Giblin was incidentally a member of that Board from 1935 to 1942, but at no time does he allow his own personality to obtrude.) Again, the full story of the ' voluntary agreement ' between the Commonwealth Treasurer and the trading banks, out of which grew the system of controls later incorporated in the 1945 legislation, is told for the first time. It is true that there is also much in this book which was already known, but now those events can be judged against a fuller knowledge of the background material and the telling of the story gains in perspective. This is not, of course, due merely to access to unpublished papers. There is also an attempt at integration and synthesis. Without doubt, there are still some rough corners, but the total effect is not unpleasing. This will become an important book of reference and the only serious blemish is the somewhat inadequate index, which in a work of this character should have been given a high priority.

J. S. G. WILSON.

Occupational Choice—An Approach to a General Theory. By ELI GINZBERG and others. Columbia University Press, New York. Oxford University Press. 1951. viii+271 pp. 24s.

The authors of this book would be the first to agree that its findings cannot be regarded as conclusive, as neither the scale nor the method of the enquiry would justify a claim that the subject has been exhaustively explored. None the less, it is a most valuable and interesting work : the subject is in itself of great importance and the implications of the conclusions are far-reaching.

Anyone with any knowledge of the personnel problems of industry knows that the youth or man in a job for which he is not suited is a frequent source of trouble ; he is himself dissatisfied and he creates dissatisfaction among those with whom he comes in contact. On the other hand there are innumerable instances of youngsters who have never shown much capacity at school who develop unsuspected powers in work that provides the stimulus and challenge that is appropriate for them. If we could really improve the opportunities for sound occupational choice we should be making a considerable step forward in the prevention both of delinquency and of industrial unrest.

In this study it is shown that there appear to be normally three stages in the approach to the choice of a job : the fantasy stage, up to the age of about eleven ; the tentative stage, in which in addition to the recognition of interests there comes, by the age of thirteen or fourteen, an understanding of the importance of relating desires to capacities, and, a little later, a developing conception of goals and values. This tentative period is succeeded by the realistic stage, starting near the end of the seventeenth year, in which, after a more thorough exploration of possibilities, the ' crystallisation ' and detailed ' specification ' of choice can take place. It is emphasised that the choice is a gradual one which may well be significantly related to the changes and phases of childhood and adolescence.

If this is true, and if realistic choice, with all that depends on it, does not normally take place until the end of the seventeenth year, it is a matter of great importance for all concerned with vocational guidance and further education. It must, for example, be recognised that decisions made at the statutory school leaving age in this country are made before this period is reached and cannot therefore be assumed to be satisfactory or final. So far from expecting the school leaver to settle happily in his first job, it should be realised that he is likely to develop feelings of dissatisfaction as his attitude towards work becomes more mature. In view of these facts, added force is given to the suggestion that when the County Colleges are established they should be very closely linked to the Youth Employment Service, since the colleges will be dealing with people at the age that is of most significance in relation to occupational choice.

It is impossible to read this book without being forcibly reminded of the dangerous gulf that lies between social administration and social research. The facts presented are of vital importance to those concerned with the development of the Youth Employment Service and of education. Such facts should form part of the foundation on which administrative plans are based, as medical facts are at the foundation of the health service. Too often, in social administration, we sadly lack, not only the facts, but the knowledge of our ignorance.

B. N. SEEAR.

The Science of Wealth. By J. A. HOBSON. Fourth Edition. Revised by R. F. HARROD. Oxford. 1950. ix + 214 pp. 5s.

This little book is not one of those which continue to be printed and read merely because they are well established in a well established collection. Even today, forty years after it was first published, it could still well stand by its own merits, without the support given by membership of the Home University Library. There are few enough books on Economics written in the first years of this century which could with profit be reprinted and re-read today, but this is one of them. It is not given to many to possess at the same time a powerful grasp of the principles of orthodoxy and a penetrating criticism of their assumptions, but Hobson was so gifted.

The Science of Wealth concerns itself very little with the part of Hobson's unorthodoxy which is the best known today. The theory of underconsumption, which was to make him a Minor Prophet of Keynes, hardly appears at all. The major unorthodoxy here is the distinction between the productive and the unproductive surplus. The introduction and epilogue which Mr. Harrod has written for this fourth edition are mainly concerned with a friendly and firm criticism of this concept. It is disappointing that Mr. Harrod, as one of our leading dynamisers, has not told us more about his views on Hobson's Economics of Growth. There were two grounds for Hobson's desire to eliminate unproductive surplus : one was moral ; the other was a desire to maximise the rate of growth of the economy. Certainly Hobson did not doubt that if the rate of growth were maximised, then the stability of this growth would be assured, because there would be no underconsumption and therefore no unemployment. In this respect no doubt, he was very naïve. But essentially both Harrod in his Dynamics and Hobson are looking for the maximum steady rate of growth ; has the older writer no message for the younger ?

Such speculation must not draw us from the fact that this book was primarily designed as an introduction for the intelligent layman ; and judged by these standards it has stood up very well to time. The chapters describing the system of exchange and of payments remain admirable in their clarity and simplicity. The professional economist can have little regret if this is the first book to fall into the hands of an intelligent layman who is trying to discover something about the workings of the economic system. At the same time, one feels impelled to suggest to the publishers and editors of the series that " the fruits of sound learning " (to quote the dust jacket) in the " important branches of present day knowledge " concerned with economic affairs have advanced considerably beyond the limits represented by this section of the Library. A re-issue of a book such as this is admirable, but it is no substitute for paying regard to the fruits of the last twenty years' work and thought.

A. C. L. DAY.

Direct Placement of Corporate Securities. By E. RAYMOND COREY. Harvard Business School, Division of Research. Boston, Massachusetts. 1951. x + 233 pp. $3·50.

Directing savings into appropriate investment channels is a major function of life insurance companies. In America, the difficulties of this process have been accentuated by the enormous growth of life company assets. Largely because of the semi-compulsory nature of insurance savings and the public's demand for safety fostered by the depression experience, the total assets of U.S. life companies had reached $59·6 billion by the end of 1949, having almost doubled in the preceding decade ; company income increased accordingly. However, legal investment outlets for these large accumulations were at the same time diminishing in number, so that investment officers were required to expand their horizons in order to find profitable ways to keep their funds active. This search, combined with corporate needs arising from certain deficiencies in the established mechanism of the capital market, has resulted in the emergence and steady growth of the device of direct placement.

In the present study, originally submitted as a Ph.D. thesis at Harvard, Dr. Corey undertakes a careful examination of this method of financing from the point of view of both the borrowing company and the institutional investor. He describes the forces which lead the borrower and the lender to negotiate directly and analyses the efficacy of direct placement in fulfilling the needs of each. The institutional investor is considered in terms of the eighteen largest U.S. life insurance companies which dominate the direct placement market, and the borrowing company is represented as one of medium or large size which is seeking a principal amount of over $500,000. Illustrations are drawn from the four enlightening case studies which comprise the second half of the book.

Of considerable interest are Dr. Corey's reflections on the effects of the division existing between the public and private markets for corporate securities. He finds that governmental requirements with regard to competitive bidding and the S.E.C.'s narrow interpretation of the term " public offering " have restricted freedom of entry into the private market both for issuers and for investors other than the largest institutions. Competition has thereby been reduced : the private market is unduly influenced by a limited group of large investors, and flotations made in the public market are bereft of advantages inherent in direct placement. To meet these difficulties, the author sensibly suggests revising the Securities Act " to make public offering a far more attractive method of security flotation and to broaden the private market ". Also, he recommends expanding the use of life insurance funds in equity financing (direct placements are usually of debt issues) in order to make more flexible corporate structures which have relied too heavily on long-term borrowing, as well as to increase available investment outlets. T. R. SETON.

Vollbeschaeftigung, Inflation, Planwirtschaft. Edited by ALBERT HUNOLD. Eugen Rentsch Verlag, Erlenbach-Zuerich. 1951. 362 pp.

This volume is mainly a collection of lectures given at the Swiss Institute for International Studies during the session of 1950/51. The subject matter of these lectures was suggested by Professor Eucken, who, however, died before he could himself make his contribution, though the editor has included an article written by Eucken not long before his death, discussing recent German economic development before and after currency reform. Other contributors are Professors Amonn, Baudin, Bresciani-Turroni, Ellis, Hayek, Jewkes, Iversen, Lutz, Roepke, and Viner. An impressive list.

The essays are clearly intended in general as a major attack on those economists favouring full-employment policies, and in particular as a counterblast to the United Nations Report on National and International Measures for Full Employment. The attack is developed on several fronts, but the main concern of the authors is with the allegedly inevitable political, social and economic results of the policies favoured by the U.N. experts. Inflation and physical controls are claimed to be the outcome of full employment via credit expansion, bringing loss of freedom, maldistribution of resources, and other troubles in their train. Professor Hayek suggests that inflation must follow on full-employment policies, since imperfect mobility of labour necessitates maintenance of national expenditure above the stability level. This is so since, if the process of expansion is brought to an end, unemployment will rise when the capital goods industries contract and their workers do not readily move to other occupations. The distribution of labour during the process of expansion is different from that during a period of equilibrium, the readjustment involving a deflationary process. Professor Hayek does not, however, discuss the logical development of this thesis. It must mean the impossibility of equilibrium, since any once-and-for-all change will set up oscillation in income and employment.

Physical controls are seen as the result of the efforts by authorities to counteract inflationary developments. Professor Ellis discusses the monetary equivalent of these physical controls, i.e., selective credit controls. He favours quantitative controls as against selective controls, but implicitly seems to admit that he really only wishes that bankers rather than the central authorities shall decide who shall get credit. The stress he lays on the existence of a " fringe of unsatisfied borrowers " at a given rate of interest as an important factor in determining the effect of central banking policy indicates that some " rationing " is being done by the banks, and there seems to be no *a priori* reason why the individual banker should be a more efficient rationing agent than the central authorities.

The most interesting articles in this book are those discussing the financial and economic policies of various European countries and pride of place amongst them belongs undoubtedly to Bresciani-Turroni's extremely lucid exposition of developments in Italy. He defends the Italian government policy by claiming that the existing unemployment is due to lack of capital in conjunction with excess population, i.e., it is structural. A reduction in wages might lead to a shortening of the period of production and therefore to an absorption of more labour, but this is not possible as wages cannot fall below subsistence level. The only cure, then, is an increase in the amount of capital and/or emigration. Credit expansion could only bring inflation. It is a pity that Bresciani-Turroni does not discuss fiscal policies which might increase saving, e.g., by surplus budgeting—and which would make possible the provision of more capital equipment without inflation.

In spite of their obvious bias—or perhaps rather because of it—the essays collected in this book are extremely refreshing and stimulating. An English translation of all of them—some are available in English elsewhere—would be more than welcome.

James Lanner.

Studies in Income and Wealth. Vol. XIV. Conference on Research in Income and Wealth. National Bureau of Economic Research. New York. 1951. $3·50.

This volume consists of the seven papers presented at the April 1950 meeting of the Conference on Research in Income and Wealth. The two longest contributions are " A Perpetual Inventory of National Wealth " and " The Post-War Structure of Financial Claims " by Goldsmith and Brill respectively. Goldsmith's figures give estimates of America's national wealth in the form of reproducible tangible assets, land, gold and net foreign assets, during the last fifty years. The method of calculation is to cumulate depreciated capital expenditures. At constant prices, he finds the national wealth to have been almost exactly the same in 1944 as in 1928, when it was more than twice the 1904 level. The problem Brill attempts to answer is, how far might the present debt structure aggravate a decline in debtors' incomes. The conclusion he reaches is that the rapid rise in private debt since the war has not been disproportionate to the increase in other relevant magnitudes, such as debtors' incomes and financial assets held by debtors.

The next three papers are of rather more technical and limited interest ; they are " Measuring Estate Tax Wealth " by Mendershausen and Goldsmith, a " Review of the Composition of Estates Survey ", by Yntema, and " Using Assessed Valuations in Wealth Measurement " by Manvel. To many economists, especially on this side of the Atlantic, it will be the final two essays which will be of most interest. They both develop theoretical discussion of the effects of asset structures on economic behaviour. The essentials of Boulding's paper will be known to readers of his " Reconstruction of Economics " and to them his paper will be of most interest for the sake of four incisive comments on his system, with which Boulding does not completely come to grips in a reply. The other paper, by Klein, uses Survey Research Center data as a basis of investigation of the effect of assets on consumer behaviour. It appears that the effects on saving of changes in liquid assets depends to an important extent on income levels and recent income changes; moreover attention must be paid to non-liquid assets.

A. C. L. Day.

Introduction to Economics. By Henry William Spiegel. The Blakiston Company. New York. 1951. 589 pp. $5.

An introductory textbook by the author of the excellent *Current Economic Problems* is to be welcomed. Professor Spiegel begins by defining economics and describing the characteristic features of an exchange economy, viz., specialisation of activity and money. In the second part, he proceeds from a general explanation of the pricing of goods and services to an analysis of the nature and behaviour of national income. The third and fourth parts deal with the theories of production and distribution respectively, and the fifth part with foreign and government accounts. Thus, Professor Spiegel first establishes the nature and behaviour of macro-economic aggregates, and thereafter shows how these are generated in the different sectors of the economy. His treatment is always realistic, and the analysis is, as far as possible, illustrated by and related to empirical findings. Yet, while he keeps his feet firmly planted on the ground, he never becomes pedestrian. It is like most American textbooks in its comprehensiveness; but it is unlike many in that Professor Spiegel's style is an aid rather than a barrier to comprehension.

Despite the book's virtues, it is difficult to find any category of student to whom it can be recommended unreservedly. The author's intention, as expressed in the preface, was to cover the ground of "an intensive one-semester course or of a less intensive two-semester course". It was thus meant to be, presumably, an introductory textbook for students beginning their study of economics. But Professor Spiegel goes too far too fast to satisfy the real needs of such students. An average beginner rushing through *Introduction to Economics* even in two semesters may emerge with little more than a conversational knowledge of the subject; he is unlikely to have acquired a firm grasp of the basic tools of economic analysis. So the book is too comprehensive to be satisfactory for prospective economics specialists, and too difficult to meet the needs of those taking a short course in economics as a subsidiary subject. It would be admirable, however, for second- or third-year students who lack perspective and who want to see how the different parts of the subject fit together.

W. J. L. Ryan.

Compulsory Labor Arbitration in France, 1936–1939. By JOEL COLTON. Columbia University Press. London: Geoffrey Cumberlege. 1951. 220 pp. 21s.

Inspired by M. Leon Blum, the Popular Front government of France attempted to cure unemployment by the introduction of a 40-hour week, to raise the standard of living of the working-class by raising wages, and to prevent strikes by compulsory arbitration. It is on this last feature of L' Expériment Blum that Mr. Colton has concentrated his attention, and provided, for the first time in English, a detailed examination.

Compulsory arbitration was not a part of M. Blum's original plans, but events following the electoral victory of the Popular Front forced him to adopt it. Too impatient to wait for the policy of the government to be put into effect, almost two million workers were on strike within a month of Blum taking office, far and away the largest strike wave in the history of the Third Republic. The refusal of the employers to enter into collective agreements—collective bargaining was almost non-existent in pre-war France—led the C.G.T. to give its support to compulsory arbitration, which was introduced as a temporary measure in December 1936, and given more permanent status in 1938.

That some government-provided machinery was required to assist unions and managements to arrive at peaceful solutions to their disputes was obvious, but the success claimed by Mr. Colton for the system of compulsory arbitration is extremely doubtful. The fall in the number of strikes after the astronomical figures for 1936 is not in itself evidence that compulsory arbitration had been effective; in fact the years 1937 and 1938 saw more industrial unrest in France than in any previous years except for 1919 and 1920, and 1930. It is significant that by 1939 the C.G.T. was opposing the continuance of compulsory arbitration, and in 1945 both employers' organisations and trade unions refused to agree to its reintroduction. Mr. Colton quotes with approval Blum's declaration during the Riom Trial, that compulsory arbitration had been one of the most important social reforms introduced under his administration. This it may have been, but it did not encourage employers and trade unions to settle their differences round a table in a spirit of give and take, which was the real need in France. It tried to substitute a court for a battle in the streets and in so doing took a long stride down a road which ended with the totalitarian Vichy Charter of Labour.

B. C. ROBERTS.

Industries in Welsh Country Towns. By A. BEACHAM. Oxford University Press. 1951. vi + 91 pp. 6s.

This is a factual study undertaken soon after the end of the war, on the recommendation of the Development Commissioners, with a view to the possibility of establishing light industries in Welsh country towns. Forty-two such towns, with populations of between 2—10,000 persons, were surveyed, together with some 150 firms. The extent of present industrial activity is small, employing about 12,000 persons, of whom over half find work in undertakings, mainly in light engineering and small chemical concerns, established since 1939. For indigenous rural industries there appears to be little prospect of expansion, and thus development depends on the attraction of new concerns. The location of undertakings established under war-time conditions often depended on fortuitous circumstances, but their experience does not appear to have been unsatisfactory. The disadvantages of goods transport in this mountainous area have not proved to be unduly great, and there is the compensating factor of supplies of labour, amenable and willing to learn new techniques. The key to the further expansion, however, as Professor Beacham rightly suggests, lies in the provision by central and local authorities of public utility facilities, such as power, sanitation, water, and technical education. The paragraphs on water supply and especially on sewage disposal might well have been written by Edwin Chadwick a century ago; the comment that " available evidence suggests that the absence of this (latter) essential amenity has been a deterrent to the establishment of new industry " is the measure of the change which has taken place in the intervening years. But the apparent unwillingness of at least half the towns surveyed to provide such facilities, does not make for sanguine hopes of a large development of light industry in the area, however desirable it might be from the point of view of raising the standard of living in rural Wales.

A. H. JOHN.

First Report of the National Income Committee, April, 1951. Issued by the Department of Economic Affairs, Ministry of Finance, Government of India. Calcutta. 1951. pp. 102. 2s.

In 1949 the Government of India appointed a committee who were given the task of preparing national income estimates. Its members included Professor V. K. Rao, whose earlier national income estimates for India are well known, and advice was sought from Professor Kuznets, Mr. J. R. N. Stone and Dr. Dierksen. This preliminary report, giving estimates for 1948–49 only, is to be followed, we are told, by a final report. It is a highly interesting document both because of its discussion of methods of calculation and the picture it gives of the Indian economy.

After a lucid chapter on the general reasons for national income computations, the report considers the question of method. For obvious reasons, the output method is the most satisfactory, as has been used in British dependent territories and also more recently in Malaya by Dr. Benham. As a considerable proportion of annual output in India is not exchanged, the problem of value imputation is a very real one. In what is termed the " monetary sector ", the keeping of accounts is exceptional and the collection of data from individual enterprises is handicapped by the prevalence of illiteracy. Even in following the output method, which presupposes adequate statistics of the distribution of the working population among industry, agriculture and service occupations, information regarding occupational distribution has to be obtained by sampling methods. All these difficulties and their implications for the accuracy of the final calculations are frankly discussed in the report. The interesting suggestion is made that " it may be necessary for estimates of India's income to include a classification of ' monetary ' and ' non-monetary ' sectors which one would not find in national income estimates of other countries " (p. 12).

The statistics provide a vivid commentary on the persistent poverty of the masses in India in the calculations of *per capita* incomes and of net output *per capita* in different industries. When a series of annual estimates of income and expenditure is available, the calculations will, of course, have added significance.

Finally it should be mentioned that the report is a model of presentation. Only the consolidated tables are produced in the text, so that the economist, who is primarily interested in the end-product of national income estimates, is not obliged to wade through pages of subsidiary tables and references. For the national income statistician there is an exhaustive appendix of notes and sources which runs to 50 pages.

ALAN T. PEACOCK.

Conditions of Full Employment. By KARL GRUBER. Translated by Jean Meyer. William Hodge & Co. Ltd., London. 1952. 141 pp. 12s. 6d.

In the first part of this book Dr. Gruber analyses the flow of purchasing power through the different stages of the consumption goods and investment goods industries, and the part played by the credit apparatus in transferring purchasing power between them. The second part is a discussion of the trade cycle. The treatment is by no means systematic. Strong emphasis is placed on the lag of costs behind prices, the effect of this lag on profits being used to explain the cumulative expansion and contraction phases. Dr. Gruber considers that the necessary condition for recovery from depression is the reduction of costs ; the possible alternative of stimulating aggregate demand in order to raise prices and profits is less heavily stressed.

The discussion of the crisis following an expansion is rather obscure. The expansion is checked when the limit of capacity of the investment goods industry is reached and prices of investment goods begin to rise. " The excess of saved capital is then forced back into the credit apparatus and there raises the bank reserves. This gives rise to a new crisis " (p. 83). Alternatively, the crisis may occur because " the saved purchasing power falls so far that the production goods industries suspend their own investment because of bad business " (p. 125).

The final part deals with policy. Government arbitration and fixing of wages in relation to prices is advocated. Credit policy should be used to assist in internal stabilisation, and the Government should make use of fiscal policy and direct investment when these are appropriate. The aim should be to achieve that degree of state control which is necessary to maintain stability, while not impeding the forces making for development and improved productivity.

A. W. PHILLIPS.

Industry and Planning in Stepney. A Report presented to the Stepney Reconstruction Group. By D. L. MUNBY. Geoffrey Cumberlege. Oxford University Press. 1951. xv + 466 pp. 30s.

War reduced the 1938 population of Stepney (200,000 people living in 1,766 acres) by two-thirds. This book examines the housing, industrial and other social problems of the borough in relation to the aim of the London Plan to stabilise population at the post-war level.

The London Plan is considered inadequate ; population movement not accompanied by industrial decentralisation merely substitutes one kind of social cost for another. The solution is movement of both population and industry. Commendable emphasis is laid upon the need for detailed knowledge ; the author provides a great deal of information about the past history and present social and industrial development of Stepney. The difficulties of industrial movement are admitted, but it is believed that much could be done by closer co-operation between individual firms and local planning authorities. It is difficult to reconcile this atomistic attitude with the expressed view that it should be possible to move much of the clothing industry to a new trading estate.

The author believes congestion and factory overcrowding in Stepney to be largely due to failure to make producers bear the social costs of enterprise. But there is scant consideration of the possible use of fiscal measures to redress this, as a possible alternative to the dangers of direct control.

J. WISEMAN.

Principles of Finance and Investment. By LEWIS G. WHYTE. Cambridge University Press for the Institute of Actuaries and the Faculty of Actuaries. Vol. I, 1949, xi + 192 pp. ; Vol. II, 1950, vii + 176 pp.

This book has been written by an experienced investment adviser as a textbook for actuarial examinations. A number of the chapters are, in effect, a potted introduction to economics, and the academic student will find these too distilled for his needs. The two volumes will, however, provide him with a useful introduction to the stock-in-trade of the securities market: to the various types of marketable claims, and in particular to gilt-edged securities and their peculiarities; and will show him what the capital market looks like to a professional investor.

Mr. Whyte does not include what would have been especially interesting, a description of the way in which decisions are reached during the actual process of choosing and shuffling investment portfolios and of picking the "best" investments out of a very large number of "possibles", but he shows in general terms the problems to be faced and says a good deal about the mechanics of investment and about the data necessary for choice. The book will undoubtedly be a very useful guide to investors and their advisers.

There is no index, but with Volume II are two elegant charts classifying the national debt as at 31st March 1948 by form, life and (tentatively) principal holders, and showing the issue terms of British Government Securities, 1918–1948.

H. C. Edey.

SHORTER NOTICES

Théorie Générale de la Population. Volume I. Économie et Population. By Alfred Sauvy. Presses Universitaires de France, Paris. 1952. 370 pp. Fr. 1,200.

The main characteristic of this work, written by the Director of the Institut d'Études Démographiques in Paris, is the attempt to expound the economics of population by means of simple geometry. The discussion of the concept of the optimum population, anticipated in Boulding's *Economic Analysis*, lends itself to this method, and Professor Sauvy's analysis is very competent. However, the alliance of theory and practice in the work is not a very happy one. It requires a much more dynamic treatment than is used in the book and a greater familiarity in the methods of modern economic analysis. The reviewer must also take exception to some of the interpretation of Malthusianism given by Professor Sauvy. Nevertheless, the economist is bound to be interested in the approach to the subject and the method of treatment, and the work can be recommended on that account.

Measures for the Economic Development of Under-Developed Countries. United Nations. 1951. H.M. Stationery Office. ix + 108 pp. 5s.

This report was prepared by a group of five international experts appointed in terms of a resolution of the Economic and Social Council —four of them from "under-developed" countries with (appropriately enough) an American chairman. The group have interpreted "under-development" in terms of "poverty" and make no bones about it.

They link under-development in this sense with under-employment and seek its eradication in a broadly based investment programme. First, they discuss the social and political framework prerequisite for economic development and pass on to consider the role of improvements in technology and the problems of domestic capital formation. They are only too obviously aware of the dangers of a rapidly growing population in preventing a noticeable improvement in average living standards. Two chapters on Development Planning—with due emphasis on the question of priorities—round off Part II. The final sections concern possible international action and, in this context, the importance of favourable and stable terms of trade and of capital from abroad is analysed.

The Economic Development of Guatemala. International Bank for Reconstruction and Development. Washington. 1951. xviii + 305 pp. $5.

This report, prepared by an I.B.R.D. Economic Survey Mission of six full-time technical experts, provides an objective analysis of the economic potentialities of Guatemala, together with a consideration of the related problems. Against the general background of the Guatemalan economy and its fundamental problems, the report examines the position in specific sectors, including agriculture, industry, mining and petroleum, transportation, telecommunications, and power. It considers also public policies affecting development—e.g. labour policies, health, and administration. It provides an appraisal of the financial resources available to Guatemala for carrying out its development programme and concludes with an outline of three alternative investment programmes—what it regards as the "optimum", a "reduced" programme (which is presumably closer to practical politics), and a "pay-as-you-go" programme.

La Rémunération du Travail et la Politique du Salaire. Cahiers. Série B, Nos. 4 and 5. Institut de Science Économique Appliquée. Paris. 1950. 126, 88 pp.

The fourth in the series of papers published by the above Institute is a collection of studies of models of wage determinants. Most of the ground covered is known to British students of wage theory, but it is useful to have a treatment of this kind which systematically follows the development from Marshall to Dunlop. Paper No. 5 is a study of consumption expenditures based mainly on the studies of the Oxford Institute of Statistics and an inquiry into family budgets of workers in France. In these days of expensive printing cheap methods of presenting the results of research are to be welcomed; unfortunately, this production is marred by bad duplicating on poor paper which makes reading unnecessarily toilsome.

Labour Policies in the West Indies. International Labour Office. Geneva. 1952. pp. 377. 13s. 6d.

This is the latest of the series of reports by the I.L.O. on labour conditions in countries about which relatively little is known in Europe, except to a few specialists. This report is a broad survey of labour policies and problems in the Caribbean area, and covers 16 territories under the jurisdiction of Britain, France, the Netherlands and the United States, ranging from French Guiana with a population of 28,500, to Puerto Rico with over two million. Labour conditions vary a great deal and in most of these territories are affected by the unsolved problems of a rapidly rising population and a low income per head. Nevertheless, in spite of the limitations imposed by these pressing difficulties, a considerable advance has taken place since the war in the protection of workers : labour legislation has been extended, trade unions have developed, and the machinery of industrial relations has been built up.

Foreign Investment. By Sir ARTHUR SALTER. Essays in International Finance No. 12. February, 1951. Princeton University. 56 pp.

Against the background of British experience of overseas investment, both in its heyday (1880–1913) and during the less successful inter-war period, the author discusses the problems of foreign investment under the changed and changing conditions of a world beset both with a chronic dollar problem and the decline of the private investor. It is, of course, no accident that much of what he has to say relates to what the United States should do. He is also very critical of the policies pursued by the World Bank, though he has some constructive suggestions to offer as well. One which might well be followed up concerns " the association of United States institutions with British houses which have had long experience of overseas investment." Much of the material is already available elsewhere, but it is brought together in a useful way.

Economic Survey of Asia and the Far East 1950. United Nations. New York. 1951. xxiv + 534 pp. 27s. 6d.

This survey is divided into two parts. The first deals with the basic factors of development and includes chapters on resources, national income, the planning and financing of economic development, and the observable economic trends. The second reviews the developments of 1950 in the fields of agriculture and industrial production, transport, commercial policy, international trade and payments, money and finance, and concludes with an analysis of the then re-emerging problem of inflationary pressure. The story told is generally of improvement, following the end of the painful post-war recovery, but the situation described was complicated by Korea. Furthermore, despite evidence of some continued improvement, food consumption per capita still remains below pre-war levels. It is also significant that the "earlier optimistic expectation that the population problem could be left to solve itself is giving way to studies of the relation between economic development and social and cultural factors on the one hand, and the growth of population on the other."

Bibliography on Income and Wealth. Vol. I, *1937–47.* Edited by DANIEL CREAMER. Bowes & Bowes, Cambridge. 1952. xvi + 184 pp. £3 3s.

The International Association for Research in Income and Wealth has sponsored this first volume of short abstracts of articles and books on social accounting, national income and related economic analysis. There are 1,509 items culled from journals from all over the world, suitably classified according to subject and with an index of authors and discussants. There is also an index of articles according to geographical areas and a subject catalogue. The coverage in this volume is remarkable and the care in presentation is exemplary. It is to be hoped that the bibliography can be revised and extended in future years, as it is invaluable for both economists and economic statisticians. The price, however, is excessive.

The Social Framework. By J. R. HICKS. Second Edition. Oxford University Press. 1952. xii + 283 pp. 12s. 6d.

The first edition of Professor Hicks' excellent textbook appeared during the war. It would be expected, therefore, that a new edition ten years later would contain at least some alterations in the statistics. These alterations have been made. Estimates of the national income for 1949 replace those for 1938, and an instructive balance-sheet of the national capital for 1947–49 replaces the previous estimate for 1932–34 based on the work of Campion. But Professor Hicks has gone further and has added another 45 pages consisting of two supplementary chapters on social accounting and a final chapter comparing our economic position in 1938 and 1949. While one may disagree over the details of presentation there is no denying Professor Hicks' skill as an expositor, particularly in the final chapter which is a *tour de force.*

The Indian Economic Review. Vol. I, No. 1. February, 1952. Edited by V. K. R. V. RAO and B. N. GANGULI. University of Delhi. 9s.

The new post-graduate school at Delhi is already widely known and it now adds to its activities the publication of a biannual journal. The format of the first number is very similar to that of the *Economic Journal* and Cambridge also introduces the new review with an article on marginal cost pricing by Dr. Dobb. The remaining articles, all of considerable interest, are by Indian economists, including one by each editor on problems of under-developed countries. For the foreign reader also, the Notes and Memoranda on Indian official publications and economic legislation should prove useful sources of reference. It is hoped that the review will have a wide circulation, as it certainly deserves.

Personal Income Tax Reduction in a Business Contraction. By MELVIN I. WHITE. Columbia University Press, New York. 1951. 144 pp.

The United States Employment Act of 1946 has rather naturally stimulated discussion of individual methods of stabilisation, and a feature of this discussion has been the emphasis on the revenue rather than the outlay side of the central government accounts. Dr. White's study is concerned with the practical difficulties of speedy tax reduction as a method of maintaining aggregate spending in a business cycle contraction. He shows that " built-in " flexibility can have only a very limited effect on the level of personal income and that changes in tax rates would have to be made more frequently than is at present possible.

Natal Regional Survey—Trade Unions in Natal. By H. G. RINGROSE. Oxford University Press. Geoffrey Cumberlege. 1952. v + 111 pp. 12s. 6d.

Professor Ringrose has traced the history of trade unionism in Natal from the early years of the nineteenth century, when British settlers set up branches of the unions of which they had been members before emigrating, to the present day. Naturally, the problem of race bulks large, dominating South African trade unionism, as it does all other aspects of social life. Professor Ringrose holds categorically that the traditional white trade union practice of racial discrimination will soon have to give way to a less restrictive policy. Apart from the issue of race, the problems which trade unions are called upon to face in Natal are similar to those in this country. The survey stresses *inter alia* the need for them to adjust their structure, assist in the promotion of industrial efficiency, and develop a greater degree of membership participation.

International Aspects of Indian Economic Development. By D. T. LAKDAWALA. Geoffrey Cumberlege. Oxford University Press, Bombay. 1951. 191 pp. 14s.

India is still all too conscious of the threat of " economic imperialism " for her to feel quite comfortable about foreign loans. Hence this book is something of an essay in persuasion directed at the author's own people. In short, his objective is to persuade Indians that they need foreign capital and must make some concessions if they are to persuade foreigners to lend it to them on acceptable terms. Dr. Lakdawala has been right to emphasise at the outset the importance of self-help and also the destructive impact on living standards of India's present rate of population growth. But the author's " Case for Foreign Capital " is the main part of his thesis, though he appreciates that if India can borrow the vast sums she needs she will ultimately become liable for related reverse transfers and her task will not be easy, if present balance of payments difficulties are any indication.

The Economic Development of Poland, 1919–1950. By J. TAYLOR. Cornell University Press, New York. Oxford University Press. 1952. xiv + 222 pp. 24s.

Mr. Taylor has made a survey of the economic problems of Poland and of the policies adopted by Polish governments to deal with them. He has provided an *aperçu* of the economic history of the country in the period, but the title of his book is perhaps a little misleading. While, for example, he is well aware of the fundamental problem of agrarian overpopulation, he does not analyse it very far. It might in fact be said as a general criticism of his book, which contains much interesting material, that it touches on too much too lightly.

Costs in Alternative Locations: The Clothing Industry. By D. C. HAGUE and P. K. NEWMAN. Cambridge University Press. 1952. vii + 73 pp. 12s. 6d.

In examining alternative location costs in the clothing industry, the authors of this monograph raise many other points of interest. As they say, the choice of the industry with the most newly established branches in South Wales prejudges the conclusions, since it suggests *a priori* that firms did not find it unduly costly to go there. The study is, therefore, largely confirmatory and methodological. In these respects it contains much interesting material. In addition to the main purpose of the book, some others are fulfilled. Among them is that of touching on the fascinating character of the London clothing trade, associated as it was with the influx of Jewish immigrants from Eastern Europe in the early years of this century.

What Do Economists Know? By BENJAMIN HIGGINS. Melbourne University Press. 1952. viii + 166 pp. 15s.

Professor Higgins believes that economists know and agree about enough to enable them to recommend policies if the objectives are clearly stated. He outlines a set of objectives which he believes to be non-controversial, given certain basic " value-judgments ", and concludes with an examination of the conflicts of interest between big business, labour and agriculture. The book is addressed to the intelligent layman and is necessarily simplified but should not be too misleading, except perhaps in the treatment of value-judgments.

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No Additional payment for dependants, no territorial restrictions as to residence or treatment, no age limits, no income limits. Supplementary cash payments for all illness treated in Private or General Ward and Nursing Home beds. Children are included until they leave school or university.

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It is indispensable to many professional men and women.

Complete and post the enclosed card or telephone for the latest and improved terms:—

The Secretary,
THE WESTERN PROVIDENT ASSOCIATION,
ROYAL LONDON HOUSE,
QUEEN CHARLOTTE STREET,
BRISTOL, 1.
Tel.: Bristol 23495

BENEFITS WILL AGAIN BE IMPROVED ON JANUARY 1st, 1953

Secretary: JOHN DODD, B.Com., A.C.I.I.